Femap Tips and Tricks: Temperature Loading Import from Excel

Sometimes element or nodal temperature distributions that are created by thermal solvers are only available in the form of a spreadsheet. We would like to take these values and turn them into a load case for subsequent analysis, so let's see how to do this in Femap.

The demonstration model for this is a very simple strip of ten quad elements, and we also have a temperature distribution in the form of a spreadsheet, which has actually been saved in a comma delimited format.

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| Eler | ment ID | emperature (deg C) | | | | | | | | | |
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These temperatures can be imported into Femap in the form of a results vector.

In the menu select **File / Import / Analysis Results...** and in the resulting *Import Results From* dialog, select **Comma-Separated**.

| Import Results From | — |
|---------------------|-----------|
| Analysis Format | |
| Туре | ▼ |
| © NASTRAN | ABAQUS |
| NX Nastran 👻 | C ANSYS |
| Femap Neutral | C LS-DYNA |
| Omma-Separated | © MARC |
| Femap Structural | SINDA/G |
| Femap Optimization | PATRAN |
| I-DEAS | CAEFEM |
| | |
| ОК | Cancel |

Click **OK** and browse to select the spreadsheet csv file that contains the temperature distribution data.

In the Read Comma-Separated Table dialog ensure that the format settings match the spreadsheet layout. For this example we are reading in nodal data, and we'll create a new output set with an ID of 9000000. Click **OK**.

| Read Comma-Separa | | × | | |
|----------------------|-----------------------------|----|--|--|
| Format | Output Type | | | |
| 📝 First Row Contai | Nodal | | | |
| First Column Cor | V First Column Contains IDs | | | |
| Set and Vector Optio | | | | |
| Create New Set | | | | |
| Add to Active Set | | | | |
| First Vector ID | 9000000 | ОК | | |
| Vectors are XYZ | Cancel | | | |

We can check the temperature values by plotting them out as if they were results vector values.

Click the **Post Data** icon on the *Post* toolbar then select the vector **9000000. Temperature (deg C)** in the *Output Set Contour* box.

| Select PostPro | cessing Data | | | | — ×- |
|----------------|----------------------------|------------------------|-------------------|---------|---------------|
| View 1 | Untitled | | | | |
| Data Selectio | n | Section Cut Options | | | |
| Category | 0Any Output 👻 | Out Model | Parallel S | ections | Section |
| Туре | Type 0Value or Magnitude 👻 | | Multiple Sections | | |
| | Data at Corners | | | | |
| Output Set | | Program | Analysi | s Type | Set Value |
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| Output Vecto | rs | | | | |
| Deformation | Transformation | Туре | | ID | Value |
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| Contour | Transformation | M | INIMUM | | |
| 9000000Te | emperature (deg C) | Node M | aximum | 11 | 335. |
| | | м | inimum | 1 | 220. |
| Final Output | Set | Contour | Options | Trac | ce Locations |
| | * | Contour | Vectors | Strea | mline Options |
| Output Set I | ncrement 1 | Laminate | Options | OF | Cancel |
| | | Freebody | Display | UK | Cancer |



The next step is to convert this results vector into a load case.

In the menu, select Model / Load / From Output... and enter a title in the following dialog, and click OK.



As this is nodal temperature data, in the *Select Type of Load* dialog, select **Temperatures** in the *Nodal Loads* column and click **OK**.

| Select Type of Load | | × | | |
|---------------------|-------------------|-------------------|--|--|
| Defined On | | | | |
| Node/Elem Opin | t 🔘 Curve 🔘 Surfa | ce 🛛 🕅 Select All | | |
| Nodal Loads | Elemental Loads | Fluid Loads | | |
| Forces/Moments | Distributed Load | Pressure | | |
| Displacements | Pressures | Tracking Quantity | | |
| Velocities | | | | |
| Accelerations | | | | |
| Temperatures | Temperatures | 🔘 Fan Curve | | |
| Heat Generation | Heat Generation | | | |
| Heat Flux | Heat Flux | | | |
| | Convection | ОК | | |
| | Radiation | | | |
| | | Cancel | | |
| | | | | |

In the subsequent *Create Loads From Output* dialog, pick up the temperature vector in the **X Vector** box, and click **OK**.

| Create Loads | s From Output | | X |
|--------------|----------------------------|------------|-----------------|
| Load Set 1 | Temperature Distrubution | | |
| Color 10 | Palette Layer 1 | Output Set | 1Table Output 👻 |
| X Vector | 00000Temperature (deg C) 👻 | RX Vector | . |
| Y Vector | | RY Vector | ▼ |
| Z Vector | | RZ Vector | - |
| Face ID | | | OK Cancel |

The temperature load definition has now been created.

You can watch the video of this Femap tip on <u>YouTube</u>.