AIM Heat Conduction in Hollow Cylinder - Pre-Analysis

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Pre-Analysis & Start-Up

Pre-Analysis

The governing equation for axisymmetric radial heat flow for a homogeneous cylinder with inner radius ri and outer radius ro is displayed below. Note that the following equation assumes that the cylinder is long enough for end effects to be ignored.

In the above equation k is the thermal conductivity, A is the surface area, T is the temperature, r is the radial position and Q is the heat generation per unit area.

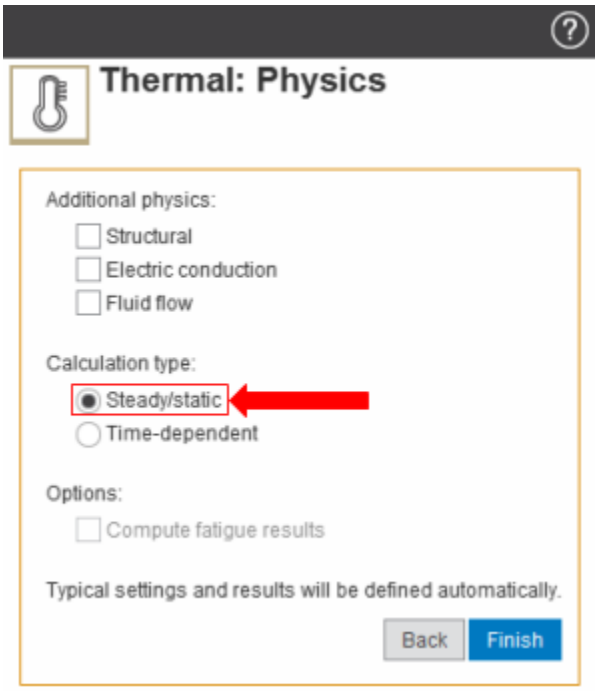
For the given problem there is no heat generation, thus the governing equation can be solved easily. The solution for temperature as a function of radial position is displayed below.

A few words on the formatting on the following instructions:

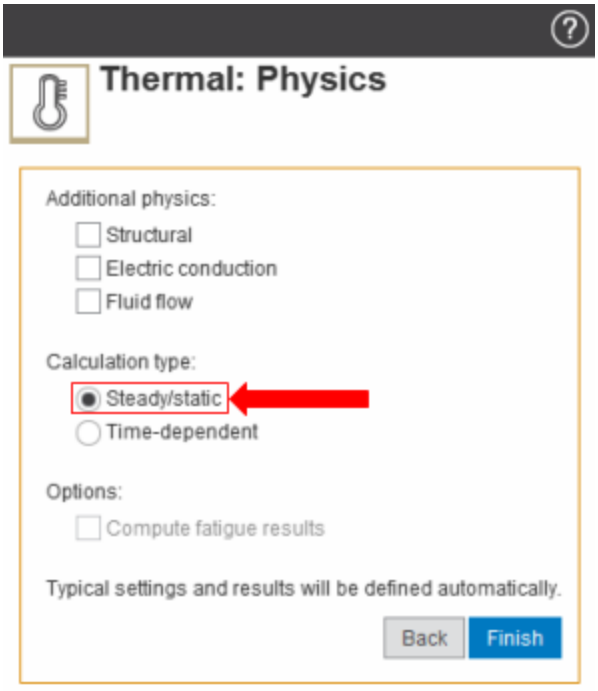
1. Notes that require you to perform an action are colored in blue
2. General information will be colored in black, but do not require any action
3. Words that are **bolded** are labels for items found in ANSYS AIM
4. Most important notes will be colored in red

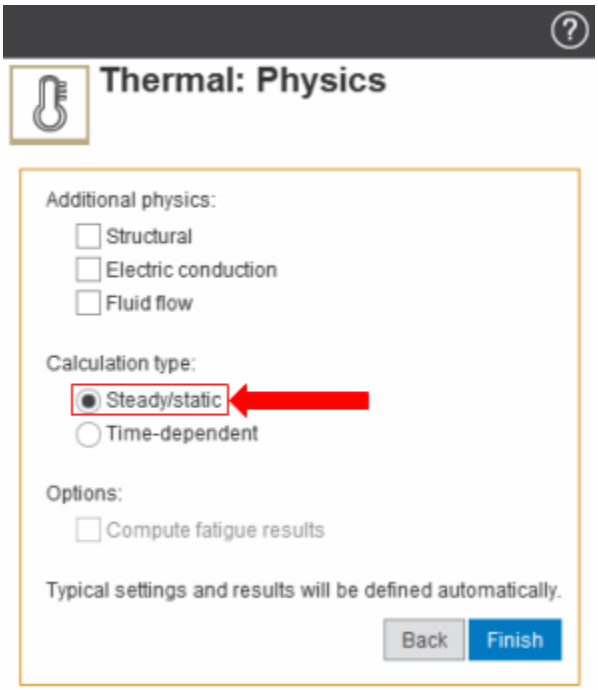
Start-Up

Now that we have the pre-calculations, we are ready begin simulating in ANSYS AIM. Open ANSYS AIM by going to **Start** > **All Apps** > **ANSYS 18.1** > **ANSYS AIM 18.1**. Once you are at the starting page of AIM select the **Thermal template** in the top right corner as shown below.



You will be prompted by the **Thermal Template** to either **Define new geometry, Import geometry file**, or **Connect to active CAD session**. Select **define new geometry** and press **Next**. For this problem we will be using a **Steady/static** calculation type so select it and press Finish. No addition physics are necessary. The Model Editor will launch automatically. In order to use the units given to us in the problem press the Home button in the top left corner and select **Units** > **U.S. Customary**.





Go to Step 2: Geometry

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