**Homework 5 Problem 5**

The problem in this SolidWorks simulation step-by-step is from the homework 5 problems as below:

**Problem 5:**

The support consists of a solid red brass C83400 copper post surrounded by a 304 stainless steel tube. Before the load is applied the gap between these two parts is 1 mm. Given the dimensions shown, determine the greatest axial load that can be applied to the rigid cap *A* without causing yielding of any one of the materials.

Diagram

Description automatically generated

With the solution as follows:

**Text, table

Description automatically generated**

Compared to this problem, students should confirm that the calculated force results in a max stress that does not result in a displacement greater than 1mm.

To answer this question, we have created a SolidWorks model with dimensions exacting that of the above problem with a few assumptions such that the model is a 3D rather than a 2D problem as in here. Using SolidWorks statics simulations, we can determine the displacement.

1. Download the HW5P5 folder and unzip the contents (Or open the file using Citrix).
2. Make sure that the Simulations tab is visible in your SolidWorks window. Right click the tool bar at the top of your SolidWorks, go to the Tabs option, and ensure that SOLIDWORKS Add-Ins is checked.
3. Open a new simulation study and select the static option with default settings.
4. Fix the geometry of the bottom of the copper post and the steel sleeve.

Graphical user interface, application

Description automatically generated

1. Add a distributed force totaling to 198 kN to the top of the cap.

Graphical user interface, application

Description automatically generated

1. Ensure the appropriate materials are applied.

Text, letter

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1. Apply a mesh to the model with the default settings, ensure that all components have a check mark next to them.
2. Run the simulation.
3. Use the displacement analysis to find the total displacement.

Bar chart

Description automatically generated with medium confidence