

## Project 1: Filament for a light bulb



### Background:

A headlight is an essential part of an automobile. Headlights differ in detail, but all have a bulb containing a filament enclosed in a transparent envelope. The filament is exposed to harsh conditions: very high temperature, vibration and a risk of oxidation. The goal of the project is to use CES to select a material for the filament.

### Objective:

To select a material that meets the requirements for the filament.

### Requirements:

- Must be an electrical conductor
- Must resist oxidation
- Must have the highest possible melting point.

The project will require the use of Level 1+2 of CES. Set the selection to Level 2, Materials. Use a Limit stage to apply the first two requirements, then a graph stage of melting point to find the material with the highest value that also meets the first two requirements. Remember you can “grey-out” materials on the graph that do not meet the limit stage criteria by clicking the little icon like two intersecting circles in the row of icons along the top of the graph.