CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
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Project Number
S1507

Project Title
Effect of Color on the Characteristics of a Heat Barrier Material

Abstract

Objectives/Goals
My project determines the effect of color on characteristics of a heat barrier material. The result of this investigation will identify the effect of color on the effectiveness of this heat barrier for fire protection of utility poles and other wooden structures.

Methods/Materials
First, I drilled a hole into the center of 5 wooden boards, all the same dimensions. I coated the top of each board with a different colors of fire protection, namely white, black, green, brown, and red. I placed each board on two supports (coating up - hole down) and inserted a temperature probe into the hole. I positioned a 500-watt heat lamp above the board and recorded the temperature every second for 30 minutes. Then, I turned the lamp off and recorded the temperature every second for 60 minutes. I replaced the lamp with a gas torch and repeated the experiments for the white and black boards.

Results
Using curve fit parameters the heating and cooling curves were compared. The heating and cooling curves show a consistent sequence of the five colors: white, green, red, brown, and black. The white board reflected the most heat and released the heat most slowly. The black board absorbed the most heat and released the heat most quickly.

Conclusions/Discussion
An explanation of the observed results has been developed to explain the evolution of temperature on the surface of a fire protective coating over time.

Summary Statement
My project determines the effect of color on characteristics of a heat barrier material.

Help Received
Mom and Dad helped with gas torch test; brohter helped set up lab top computer