CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY

Name(s)
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Project Number
J1218

Project Title
Why Are Polyurethane and Expanded Polystyrene Preferred over Other Types of Foams for Surfboard Cores?

Abstract

Objectives/Goals
My goals were to find out why Polyurethane and Expsanded Polystyrene are the best or not bes foam for surfboard cores. My second goal was to find out if any of the three other foams could replace the other two foams (PU and EPS).

Methods/Materials
materials: 1" cubes of Polyurethane, Expsanded Polystyrene, WetFoam (Floral Foam), Styro Foam,and Polystyrene, water, graduated cylinder (ml), notebook and pen, camera, digital scale (g), Pennies, small bowl.

Results
The results show that four of the foams were relatively very buoyant and that Wet Foam was not buoyant at all. Of the four foams that showed high levels of buoyancy, Polyurethane had the highest at just over 1.8 dekagrams per cubic inch. Both Polystyrene and EPS Foam were only slightly less buoyant at just under 1.6 dekagrams per cubic inch. Styrofoam measured just over 1.3 dekagrams per cubic inch.
The mass measurements did not match the buoyant force measurements for each type of foam. Polystyrene had the greatest mass at 1 gram per cubic inch. This was followed by Polyurethane at .7 grams per cubic inch, EPS at .5 grams per cubic inch, and Styrofoam at .2 grams per cubic inch. Wet Foam had the least mass at .1 grams per cubic inch.

Conclusions/Discussion
In my hypothesis I thought that the heavier foam would have the least buoyant force. The data from my experiments show this not to be true. From the data there appears to be no relationship between the mass of the foam and its buoyancy. I began this experiment believing that Wet Foam would probably have the least buoyancy but was quite surprised to discover that it also had the least mass. But the data does make sense because the Wet Foam was created as an open-cell foam to absorb water so it must have a lot of air space in it that can absorb water, which would also make it light weight. I am equally surprised to see that Polystyrene has equal buoyancy with EPS but twice the mass. Based on the data, I have to conclude that mass is not related to buoyancy when comparing different types of foam.
To answer my project question I will need to conduct further tests with hypotheses on the amount of force it takes to break the foam or how much force it takes to compress the foam. The data show that Styrofoam and Polystyrene have similar buoyancy so my new question would be, #why don#t surfboard makers use Styrofoam or Polystyrene to make surfboards?#

Summary Statement
I'm testing wether other foams can be used for surfboard cores and why Polyurethane and Expanded Polystyrene are used for surfboard cores.

Help Received
Dad helped type a little bit of the report.