



**CALIFORNIA STATE SCIENCE FAIR  
2007 PROJECT SUMMARY**

<b>Name(s)</b> <b>Justin M. Chan</b>	<b>Project Number</b> <b>J0206</b>
<b>Project Title</b> <b>The Whats and Hows of Fiber Wrap</b>	
<b>Objectives/Goals</b> To prove that fiber wrap strengthens materials	
<b>Abstract</b>	
<b>Methods/Materials</b> 20 square foot sheet of SikaWrap Hex 103C, 20 square foot sheet of SikaWrap Hex 100G, Sikadur epoxy resin, 4 empty cans, 2 1/4 in. x 3 1/2 in. x 3 ft. wooden planks, 2 3/4 in. x 1 1/2 in. x 4 ft. pieces of wood, 3 water buckets, bricks, brick paver, string, concrete masonry blocks, water, scale, shears, gloves, goggles, apron, paint rollers, resin dish	
<b>Results</b> For the Coke can test, the first can collapsed after filling up two buckets, which the total weight was 78 lbs. The second can collapsed after three buckets, where the total weight was 85 lbs. Both cans, after wrapped with SikaWrap Hex 100G, did not collapse after imposing 140 lbs of weight on the cans. There were no signs of distress. For the A <sup>1</sup> / <sub>4</sub> in. x 3 A <sup>1</sup> / <sub>2</sub> in. x 3 ft. plank, the first piece had a A <sup>1</sup> / <sub>2</sub> inch deflection, and the second had a 5/8 inch deflection. Deflection is decreased by 3/8 of an inch and by 7/16 inch accordingly. The fiber wrap decreased the deflection by about 75% - 85%. For the A# in. x 1 A <sup>1</sup> / <sub>2</sub> in. x 4 ft. wood, both pieces had 3/16 inch deflections. The fiber wrap decreased the deflection by about 1/16 of an inch and was a 33% improvement.	
<b>Conclusions/Discussion</b> Does fiber wrap strengthen materials? Fiber wrap does strengthen materials in terms of buckling and deflection. It more than doubles the amount of strength it takes to buckle an empty Coke can, as proven from 78 lbs and 85 lbs needed to crush it and the 140 lb weight, and it did not show any sign of distress. Also, the deflections of the A <sup>1</sup> / <sub>4</sub> in. x 3 A <sup>1</sup> / <sub>2</sub> in. x 3 ft. plank decreased by 75%, and the A# in. x 1 A <sup>1</sup> / <sub>2</sub> in. x 4 ft. decreased by 33%. It was hypothesized that fiber wrap strengthens materials. The hypothesis was correct because the buckling strength is increased by more than 200% and decrease the deflection by as little as 33% to 85%.	
<b>Summary Statement</b> It describes what fiber wrap is, how it works, and what it does.	
<b>Help Received</b> Mother helped with board, Father helped with board, cutting, experiment, brother helped print, Mr. Frett donated materials	