



**CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY**

<b>Name(s)</b> <b>Deng-Kai Chen</b>	<b>Project Number</b>  22599
<b>Project Title</b> <b>The Effect of Cross Drilling and Slotting on Rotor Temperature</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of my experiment was to determine the effect of cross drilling and slotting on brake rotor temperature as well as the effect on the temperature of the entire braking system.</p> <p><b>Methods/Materials</b> An automobile was driven strenuously around a 4.8 kilometer preset course. Immediately afterwards the front brake rotor temperature was measured through a non-contact infrared thermometer and the recorded. Caliper and rim temperature were also recorded. This process was repeated five times. The car was then driven around a 9.2 kilometer preset course with the same procedure which was also repeated five times. Afterwards the stock brake rotors were removed from the car and cross drilled/slotted ones of the same dimensions were installed. With the new rotors, the car underwent the same procedure for testing and the results were recorded.</p> <p><b>Results</b> On the 4.8 kilometer course, the cross drilled/slotted rotors ran on average 20% cooler than their stock counterparts. On the 9.2 kilometer course, the cross drilled/slotted rotors ran on average 35% cooler than the stock rotors. However, there was no significant difference between the caliper and rim temperatures measured when the car was equipped with the stock rotors and when the car was equipped with cross drilled/slotted rotors.</p> <p><b>Conclusions/Discussion</b> In the tested application, I can conclude that cross drilling and slotting has a definite cooling effect on brake rotors. The cooling effect became more apparent as the car was driven for a longer duration. I can also conclude that for this application, cooler rotors did not translate into a general cooling of the overall brake system as there was little or no difference between the temperatures measured of the caliper and rim on the cross drilled/slotted equipped car and on the equipped stock car.</p>	
<b>Summary Statement</b> The intent of my project was to determine if cross drilled and slotted rotors run cooler than non-cross drilled and slotted rotors.	
<b>Help Received</b> Mom helped with display board, Dad lent me the car, recieved various information and opinions from people at <a href="http://acura-cl.com">acura-cl.com</a> and <a href="http://acura-tl.com">acura-tl.com</a>	