



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Arianna S. Cassani	Project Number J1106
Project Title The Effect of the Amount of Paint on Rust Formation	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Determine if an environmentally friendly paint was capable of protecting mild steel in salt water and, if capable, the minimum amount required for protection thus determining the most efficient use of resources.</p> <p>Methods/Materials Procedure: 1.Paint pieces of steel with various layers of water-based polymer paint. Determine thickness with an electronic dry film thickness guage. 2.Leave two pieces without paint as your control. 3.Scribe pieces 3, 6, 9, and 12. 4.Suspend half of ea piece in salt water. 5.Take pictures/observations every 3 days for 3 weeks. Materials: 28 coupons of 1/8th inch mild steel; 2 buckets of seawater; 1 qt water based polymer paint; 1 electronic dry film; thickness guage; 2 wooden poles; 3 metal hangers.</p> <p>Results The average measurment of sample 1 is 16.633, sample 2 is 17.733, and sample 3 is 13.533. (AVG.(single coat of paint each)is 15.966) Sample 4 average is 21.4, sample 5 is 22.366, and sample 6 is 19.566. (AVG. (two coats of paint each)is 21.110)The average of sample 7 is 33.6, sample 8 is 29.066, and sample 9 is 26.33. (AVG. (three coats of paint each)is 31.333. Sample 10#s average is 33.9, sample 11 is 31.966, and sample 12 is 31.3. (AVG. (four coats of paint each)is 32.388) The control group was used to determine that the panels would in fact rust in the saltwater solution. The thickness of the rust on the control group panels was measured with the results being Sample 13 measuring 1.566 and sample 14 measuring 1.7133, for an average of 1.6397. The rust and paint combination on the panels was measured to determine the amount of resulting rust. The panels with a single coat of paint, panels 1-3, measured an average of 18.611. The panels with two coats of paint, panels 4-6, measured an average of 28.711. The panels with three coats of paint, panels 7-9, measured an average of 33.333. The panels with four coats of paint, panels 10-12, measured an average of 35.499.</p> <p>Conclusions/Discussion Pieces 1-3 failed. Pieces 4-6 had more rust than numbers 7-9. You need at least 34-35 mills of paint to protect the piece from rusting. This is consistent with the amount on pieces 7-9. Numbers 10-12 require more labor expended for the same result as 7-9. These results do not support the hypothesis that 2 layers is as effective as 3 layers. The findings determine that 34-35 mills (3 layers) is the right amount to use because it protects against rust and uses the least labor.</p>	
Summary Statement The project is about the protection of steel with environmentally friendly paint, and what amount you need to protect the steeel.	
Help Received Mom and Dad helped prepare and test; Mrs. McKinney helped me through a few problems.	