



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Mason Prevost; Jack Zdanowski</b>	<b>Project Number</b> <b>J2023</b>
<b>Project Title</b> <b>Waterproofing ECOR: Comparing Effectiveness of Low VOC Paint and Sealants</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> There are great concerns regarding pollution due to the burning of agricultural wastes. ECOR helps utilize these potential polluting materials. ECOR is a sustainable building material sourced only from recycled paper products, agricultural fiber wastes, and forest waste. ECOR converts waste fibers using only water and heat, and is a completely nontoxic product. ECOR has tremendous strength as a panel material. ECOR has met some challenges with waterproofing, due to very limited choices of eco-friendly sealants. The purpose of this project was to test various eco-friendly sealants for their effectiveness as moisture barriers for ECOR products.</p> <p><b>Methods</b> In our project we tested many samples of three types of ECOR products in two trials. One variation was made entirely from old recycled milk cartons, another from recycled office paper, and the last was made from recycled cardboard, milk cartons, office paper, and other recyclables. The samples were cut into smaller pieces and tested with SafeCoat, ECO Advance or Benjamin Moore Natura paints. We compared the strengths of samples with sealants applied to the control samples which had no sealants.</p> <p><b>Results</b> The strength of the ECOR ranged from 0.90 kg to 68.03 kg. Benjamin Moore Natura Paints was the most effective sealant. Compared to the water exposed ECOR, the Benjamin Moore Natura sealed ECOR on average had a 31.00kg greater strength and reduced the water intake by an average of 25%. The other two sealants, SafeCoat and ECO Advance, were much less effective compared to Benjamin Moore Natura Paints. On average the strength when compared to the control was 13.31kg greater for SafeCoat and 13.45kg greater for ECO Advance.</p> <p><b>Conclusions</b> Based on our results, water exposed ECOR performance improved due to the sealants. Benjamin Moore Natura Paints was the most effective while still maintaining the eco-friendly claims that ECOR wanted to keep secure. The ECOR controls, after being placed in water, swelled, gained weight, and were reduced in strength dramatically. For ECOR to be used for outdoor buildings a sealant should be applied as a moisture barrier. We also recommend further testing be performed on this new, sustainable product.</p>	
<b>Summary Statement</b> Our project tested various eco-friendly commercial sealants for their effectiveness as moisture barriers for ECOR products.	
<b>Help Received</b> We would like to thank Joe Stapley, an executive at ECOR, for aiding us in our research and informing us about the limitations of ECOR. And we would like to thank our parents for supervising our testing and buying our test supplies.	