

## Green Chemistry Grant Recipient Project Summary

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Working Bugs, LLC  
Clean Energy and Advanced Manufacturing Grant

Working Bugs, LLC received a grant from the Michigan Department of Environmental Quality (MDEQ) in 2010 called the Clean Energy and Advanced Manufacturing Grant which focuses on green chemistry. Working Bugs is a chemical manufacturer whose mission is to create environmentally preferred chemicals while also having greener facilities. The company is located in East Lansing with two facilities, one for research and development at 4000 ft<sup>2</sup>, and the other for production at 45,000 ft<sup>2</sup>.

N-butanol is the chemical that Working Bugs produces and through receiving this grant they were able to increase the amount they produce. N-butanol is a primary alcohol that Working Bugs produces through fermenting sugars (a biofuel), whereas other manufacturers typically produce the chemical from petroleum. Since Working Bugs produces n-butanol through biofuels, a renewable resource, their product has a more environmentally preferable process than petroleum based n-butanol, a nonrenewable resource. N-butanol is used as an intermediate chemical to manufacture other chemicals.

The 45,000 ft<sup>2</sup> production facility was purchased in mid-2011 and the grant given by MDEQ was used to help purchase some equipment for the larger facility. With a larger facility Working Bugs was able to scale up their production to be profitable. More specifically, the grant helped Working Bugs to purchase three 4000 gallon fermenters to increase productivity since their old fermenters only held 500 gallons at their smaller facility. The fermenters also had to be large in height and narrow in diameter to aid in the mixing process of production for their chemicals. With these requirements, the fermenters purchased with the grant were the largest that could fit in the 27-foot tall production facility.

With the grant received by MDEQ, Working Bugs, LLC can now focus on production with their larger facility and new equipment. The new facility is now in operation and production is running smoothly.