

Joseph Vanstrom Bio:

I'm from Ham Lake, Minnesota. I graduated from Blaine High School in 2004. My first semester at Iowa State was the fall semester of 2004. The main reason for coming to Iowa State was to play for the Iowa State football team, which I played on for 5 years. I received my bachelor's degree in Industrial Technology in December of 2008 and I immediately began graduate school following graduation. I am planning on completing my master's degree in May of 2011.



While at Iowa State, I've worked as a Lab Technician/Instructor for Dr. David Grewell's Introduction to Manufacturing class for the past 4 years. Also, I've been an active member of the Association of Technology, Management and Applied Engineering (ATMAE, formerly known as NAIT) student chapter here at Iowa State. In addition to being its president in 2008, I've held positions of Engineering Student Council Representative, and Senior Advisor.

I've also been fortunate enough to participate in several study abroad experiences. In the summer of 2007, I was a member of a group of twelve students to travel to Europe and study their manufacturing facilities and observe their management techniques. The summer of 2010, I was able to travel to Taiwan and participate in the International Industrial/Academic Leadership Experience. I was able to study with engineering students from all over Asia for twenty days. During the trip, we were able to travel throughout Taiwan and take in both the cultural and industrial communities of the island nation.

Research Summary:

The main focus of my research focuses on the mechanical and morphological properties of commercially available, biodegradable polylactic-acid (PLA) plastic refuse bags. The bags have been derived from corn protein and produced by a variety of manufacturers. To determine the mechanical properties of the plastic films, three tests were performed on the materials: tensile testing (ASTM D882), tear propagation resistance (ASTM D1922) and puncture impact resistance (ASTM D4272). These tests allowed us to determine the: ultimate tensile strength, elongation before failure, the amount of force needed to tear through the material and the amount of energy the material can absorb before failure. To test the morphological properties, the materials were tested using a Differential Scanning Calorimetry (DSC) and a Thermogravimetric Analysis (TGA) machine. The resulting data includes: Glass transition temperatures of the material, Melting Temperatures of the material, degradation temperatures and the amount of organic vs. non-organic materials within the films. The outcome of this testing is to allow for a better comparison of new biodegradable plastics that are currently on the market, as well as to further educate consumers of these products.