

## Senior Design Project Description

<b>Company Name</b>	General Steel Drum	<b>Date Submitted</b>	9/21/2017
<b>Project Title</b>	Drum Cool Down (STEEL_DRUM)	<b>Planned Starting Semester</b>	January 2018

### Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project. 250 hours are expected per person.

Complete the following table if this information is known, otherwise the Senior Design Committee will develop based on the project scope:

<b>Discipline</b>	<b>Number</b>	<b>Discipline</b>	<b>Number</b>
Mechanical	5	Electrical (EET)	2
Computer		Systems	
Other ( )			

### Project Overview:

General Steel Drum is a Charlotte based company that manufactures steel drums for a variety of clients in the Eastern US. The operation is make to order and boasts the capability to take an order and begin shipping custom configured drums within 1-2 days. With this ability to react fast, GSD is able to avoid carrying finished goods inventory. GSD is part of Myers Container, a National company that provides containers for a variety of companies across the US. Myers has a strong commitment to sustainability and the have the ability to collect, re-condition or recycle everything they produce.

In the current drum making operation, drums are painted the color of the clients choosing. The paint is cured in a convective oven. At the end of the process, the drums are transferred on a long conveyer line which passively cools the drums to a temperature that they can be handled. The objective of the project is to design a piece of equipment that cools a 55-gallon steel drum from 400 degrees F to 100 degrees F at current production rate. This device will eliminate the need for the long conveyer line and free up space for other operations.

### Project Requirements:

Design a cooling booth that reduces the drum temperature by 300 degrees F in less than 20 seconds with continuous throughput of 600 drum per hour, a cost of less than \$12,000, and little maintenance. Floor space is not critical but is important. Device must replace the functional flow of the current process (i.e. automated without operator involvement)

### Expected Deliverables/Results:

- General design outlining the cooling process



UNC CHARLOTTE

*The WILLIAM STATES LEE COLLEGE of ENGINEERING*

- Prints for equipment
  - Plan view
  - Construction, if necessary
  - Mechanical
  - Electrical
- Proof of concept model

**Disposition of Deliverables at the End of the Project:**

Turned over to GSD after the completion of the Expo, unless GSD chooses to do a follow-on project with this equipment.

**List here any specific skills, requirements, knowledge needed or suggested (If none please state none):**

- Design reviews will be held at General Steel Drum's Charlotte location, project lead will be required to schedule this with team and supporter
- Implementation will involve PLC's. Must have completed EET coursework for PLC's.