Humanitarian Outreach B  
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**Abstract**  
The issue of people without footwear in developing countries is a significant issue in today’s society, and it affects over 300 million people. One in seven people suffer from soil transmitted parasites. This system will produce inexpensive flip-flop type shoes made from recyclable plastic waste found in these countries.

**Objective**  
The objective of this humanitarian outreach project was to design an affordable system that would improve the lives of those living in developing countries.

**Design Requirements**  
- Universal Language Controls  
- Large Range of Shoe Sizes Available  
- Use a 1 shoe mold to make shoes for both feet  
- Keeping a total cost low for the entire system  
- The ability of the system to run on local power supplies in developing countries  
- The minimum temperature of the center of the mold will be 120°C (250°F)

**Analysis and Testing**  
Thermal and mechanical analyses were carried out using ANSYS. Analysis of the molding process determined the process to take about 8 minutes per shoe formation. The thermal results also show that the majority of the outer parts of the assembly do not exceed 25°C (77°F) after a usage of 10 minutes, and the mold will survive $10^8$ life cycles of quenching (5 million pairs of shoes).

**Reach**  
Shoe size range will cover at least 70% of the total number of people without proper footwear. Charity organizations and/or private persons can use the system to produce shoes.

**The Mold**  
- Men size 13 - 3 (5 Women’s)  
- One mold for both feet  
- Weight 20 lbs  
- 3:1 Compression Ratio