High School

TROPICANA

#1 - Container Challenge Instructions

Created by the FLATE Center for Manufacturing Education, Hillsborough Community College
10414 E Columbus Dr., Tampa, FL 33619 • (813) 259-6577 • www.fl-ate.org

The Scenario

Tropicana receives truckloads of oranges from over 400 orchards in Florida. These oranges are de-stemmed, sorted, washed, graded and the juice extracted. Thus, Tropicana transforms acres of orange trees into thousands of gallons fresh orange juice. Once processed and placed in 250,000 gallon tanks, the juice needs to be poured into individual containers, boxed, shipped and displayed in your grocery store before you pick it off the store shelf, take it home, and enjoy a glass of Florida orange juice.

Industries like Tropicana are always looking for new ideas to present their products to different consumers groups. For this reason, you have been hired by Tropicana to propose a new design for their 64 oz carton (see figure below) and subsequent label that will appeal to a consumer group of your choice. The challenge may be accomplished individually, in teams or as a class project.

The Challenge

1. Review the provided *Design Constraints*. See your teacher for hints on identifying the problem, brainstorming, and analyzing your solutions.
2. Define the consumer group your design will be marketed to.
3. Sketch your preliminary design ideas for the container.
4. Sketch your preliminary design ideas for the label.
5. Once your teacher approves your preliminary designs, create a 3D drawing of your container and its label.
6. Create a 3D model of your container using modeling clay or foam board (if requested by your teacher).
7. Create a Power Point presentation to share your solution to this challenge. Include any research you collected. Identify a consumer group and state why your proposed container will be attractive to the consumer and valuable to the company.

Suggested Assessment

1. Preliminary sketch	25 points
2. 3D drawing of container	25 points
3. Label	25 points
4. Presentation	25 points
5. 3D model	25 points (optional)
	Total points – 100-125 points

The Conclusion

When finished, you will have completed a realistic exercise in modern manufacturing. Did you enjoy this challenge? Is manufacturing a career choice you would like to pursue? Check out additional challenges and resources at www.madeinflorida.org.

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DESIGN CONSTRAINTS

Instructions

For new ideas to be functional and feasible, you must work with the constraints of a problem. Study the constraints below and brainstorm possible solutions with fellow students and your instructor.

Current Container:

The current **container** has the following data:

1. Holds 64 oz of liquid.
2. Has a cuboid body with the top in the shape of a pyramid. For information about conversion calculations visit http://www.projects.ex.ac.uk/trol/scol/ccvol.htm.
3. The overall height is about 9 inches, with a square bottom of width and length 4 inches each.
4. Is made of wax coated cardboard.
5. Have a one inch opening for easy filling at production fill stations.
6. One case holds 8 individual containers.

Container constraints:

Your proposed **container** must:

1. Hold 64 oz of liquid.
2. Fit together with each other for easy packaging and transportation.
3. Have an opening of at least one inch diameter in order to use the existing container filling stations at the plant.
4. Be no taller than 12 inches high in order to fit a typical shelf at a grocery store.
5. Be made out of plastic or cardboard.
6. The new label must fit on the surface of the container.

Label constraints:

Your proposed **label** must include:

- company logo
- product name
- fluid volume
- nutritional panel
- bar code
- ingredients

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Questions:

1. How different is the shape of the new container to the current carton (example, has it change from square to circular?).
2. Has the overall height changed?
3. Has the material of which it is made changed, and if so why?
4. Calculate the base area of 8 of the new containers in squared inches (in^2).
5. Calculate the area of the base of the container (or the area of the widest portion). This will determine how many containers can fit in the current case.
6. What is the percentage difference between your new container and that of the current one?

Useful websites:

1. www.tropicana.com
2. www.grahampackaging.com
3. http://www.projects.ex.ac.uk/trol/scol/ccvol.htm(Conversion Calculator)
4. www.madeinflorida.org

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