

Design For A Hair Dryer

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Type: Design Project
Student Time: Two Weeks
Location: Classroom/Home

Summary

This project is for the design of a consumer type hair dryer. This should include the physical design, the mechanical design, and the electrical design. Applicable safety standards must be met. A GFI (ground fault interrupter) is to be included as a part of this design.

ABET Descriptors

Engr Sci Content: Freshman Design
Type: Component
Elements: Establish Criteria, Synthesis, Evaluation
Features: Methodology, Formulate Specifications, Open-Ended
Constraints: Economic Factors, Safety, Human Factors
Effort: Team

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This project calls for the design of a consumer type of a hair dryer. This includes the physical design, the mechanical design and the electrical design. The applicable areas which will need to be researched or considered are the following.

- The human factors considered in the design of the case, switches and the hand grip (or method of holding the appliance).
- The mechanical aspects.
- The electrical design.
- The electrical safety aspects.
- The thermal safety.

The applicable electrical and thermal safety standards must be researched and the agency with jurisdiction identified. In addition, in the final report compare generally accepted safety standards against those in the regulations.

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Objectives/Comments:

This project calls for the physical (human factors) design, the mechanical and electrical design of a hair dryer. In addition it includes the research of the applicable standards such a device must meet. This includes both the electrical, electrical leakage, ground fault protection and thermal protection. Consumer type hair dryers are sold with ground fault interrupters (GFIs) built in as a part of the appliance. They are also sold with build in thermal protection. Both of these items should be included in the design.

Expected Outcomes:

This project should make students aware that more than physical shape makes up a design for a consumer product. They must be aware of the safety aspects and particularly aware of the safety standards and the agencies with jurisdiction.

Engineering Notes:

When students have completed researching the safety standards for hair dryers, they may wish to disassemble one of these to find the various safety related items which make up a part of this design. On consumer type hair dryers most of these safety features are one shot devices. If the thermal safety fuse opens then the dryer is rendered inoperative and the fuse itself must be replaced. The built in GFI may be similar in nature. This makes repeated testing of these safety features impossible.

While students are examining the hair dryer they also may want to trace the wiring to determine how the manufacturer changed the blower speed and the temperature of the dryer (different drying settings).