

Auto-Scrubber

Sponsor: 3M

Sponsor's General Mission or Business Statement: 3M's commitment is to actively contribute to sustainable development through the environmental protection, social responsibility and economic progress. To us, that means meeting the needs of society today, while respecting the ability of future generations to meet their needs.

Sponsor's Advisor, Title, and Phone Number: Lloyd Vasilakes, Senior Product Development Specialist, 651-733-4939

Sponsor's Address: 3M Center, Building 42-6E-37, St. Paul, MN 55144

University of St. Thomas School of Engineering Academic Advisor: Dr. AnnMarie Thomas

Team Member Names: Charlie Bloemendal (ME), Soumanou Eusebio (EE), Mark Kaardal (EE), Carl Siegler (ME)

Senior Design Clinic I-II (ENGR 480-1) 2007-8 Project Mission Statement: Residential window cleaning is a chore that consumers hate to do. Project goal is to make window cleaning easier. Develop an auto-scrubbing squeegee for window cleaning.

Major Design Requirements:

- Design for handheld use.
- Operate off consumer batteries.
- Utilize replaceable components.
- Contain both a scrubbing apparatus and a squeegee.
- Simple to operate.
- Design to be used with liquid cleaning agents (ex. Windex).
- Appeal to consumers.
- User safety.

Senior Design Project Summary: This project began as a fairly open ended enterprise to design a device that would reduce the amount of time and physical effort a person puts into cleaning a window. Extensive brainstorming and concept generation was performed to bring a wide variety of ideas to the table. These ideas were then analyzed using the customer and product requirements to narrow the selection down to a few concepts. The concepts underwent preliminary testing and in the end a design was selected that incorporated DC vibration motors attached to a polymer bristle brush with a sponge on the trailing edge and a squeegee on the flip side. This concept was prototyped from the SolidWorks model using Fused Deposition Modeling (FDM). This prototype was then used for a focus group as well as Design Verification Testing (DVT).

