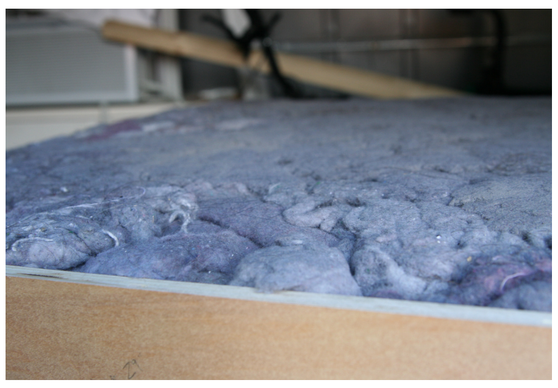
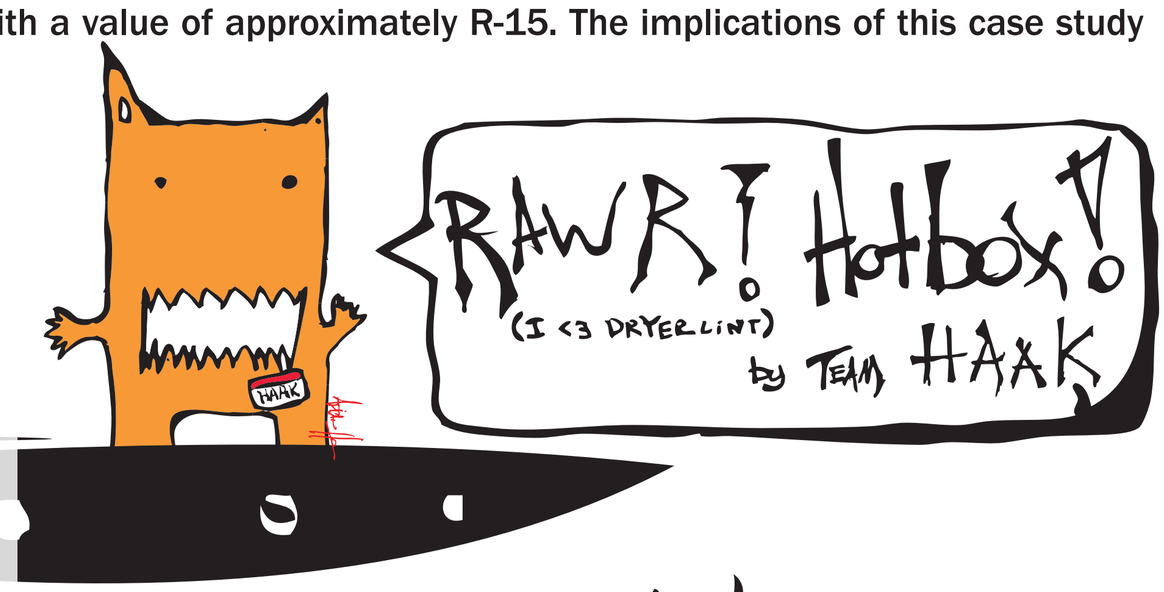
not from your belly button...

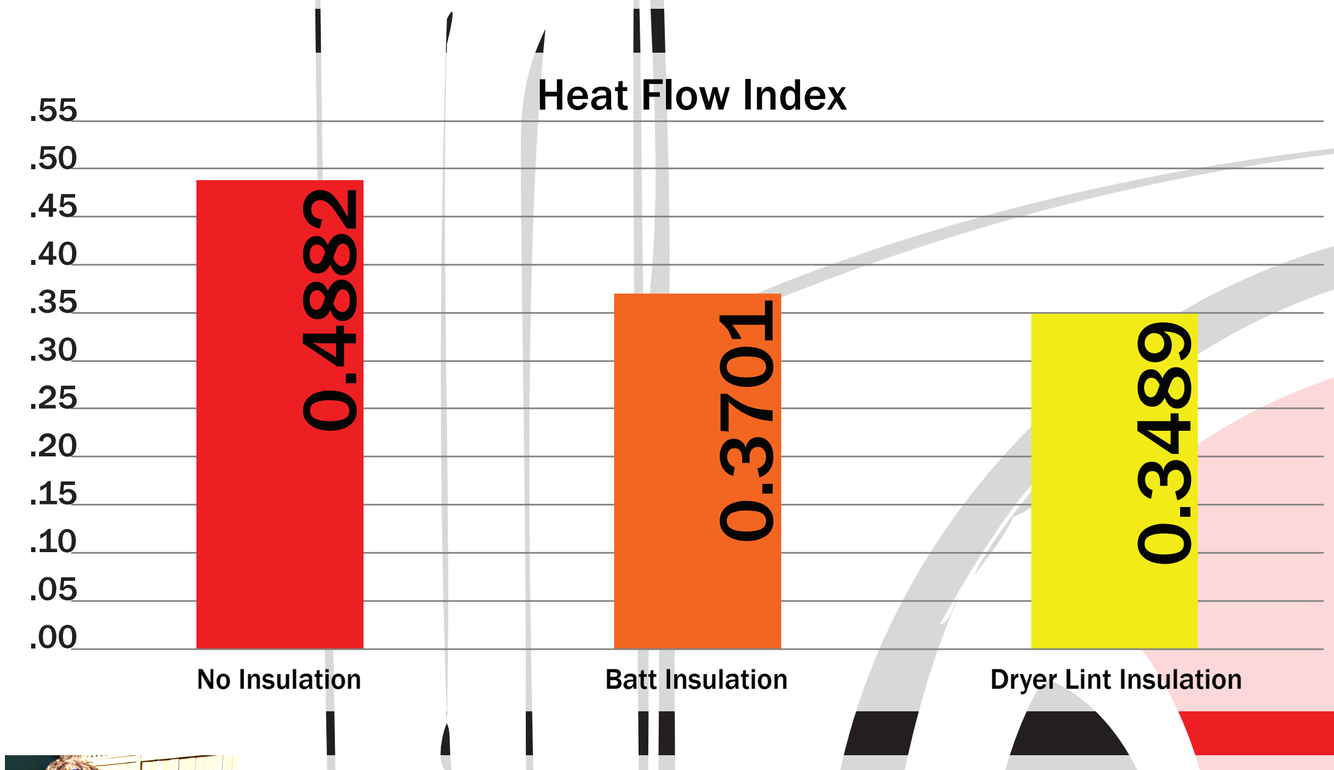


After hearing a presentation given by a Winter 2007 ECS I Case Study Team (This is Not a Toy.)1 who conducted a study regarding the insulation properties of plastic bags, we became interested in experimenting with a different type of salvageable material, while improving upon their methods. In our study, we tested the insulation properties of dryer lint. Dryer lint is a byproduct of a weekly chore in the common household. This byproduct is thrown away and currently serves no reusable application. Instead of disposing of this product in landfills, it is potentially applicable as wall insulation in residential structures. To test the insulation properties of the dryer lint, we used a semi-guarded "Hot Box". When tested, we found that the dryer lint exceeded the R-13 value of Standard Fiberglass Batt Insulation with a value of approximately R-15. The implications of this case study could lead to the development of another building material that could contribute to the Green Initiative.

Hypothesis:

"The R-value of insulation made from dryer lint at a density of 3.39 lbs./ft.^{3} will be greater than R-13."





Backup heat source.

Heat Flow Indexes (HFI):

Empty Specimen Box: 0.4882

R-13 Fiberglass Batt Insulation: 0.3701

Dryer Lint Insulation: .3489

HFI (empty wall) - HFI (standard insulation) = Calibrated Heat Flow Resistance (standard insulation)

0.4482 - 0.3701 = 0.1181

Fluffy Dryer Lint.

HFI (empty wall) - HFI (dryer lint) = Calibrated Heat Flow Resistance (dryer lint)

0.4482 - 0.3489 = 0.1393

Heat Flow Resistance (dryer lint) / Heat Flow Resistance (standard insulation) = Performance Ratio

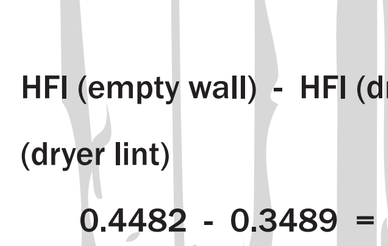
0.1393 / 0.1181 = 1.1801

The Dryer Lint resisted 118.01% as much heat as standard insulation.

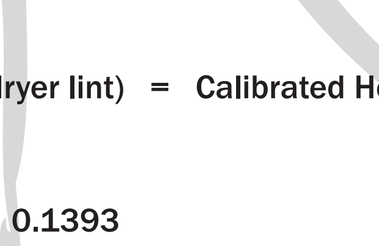
(R-13) x 1.1801 = (R-15.3412)

"Data Loggers,"

nail it!



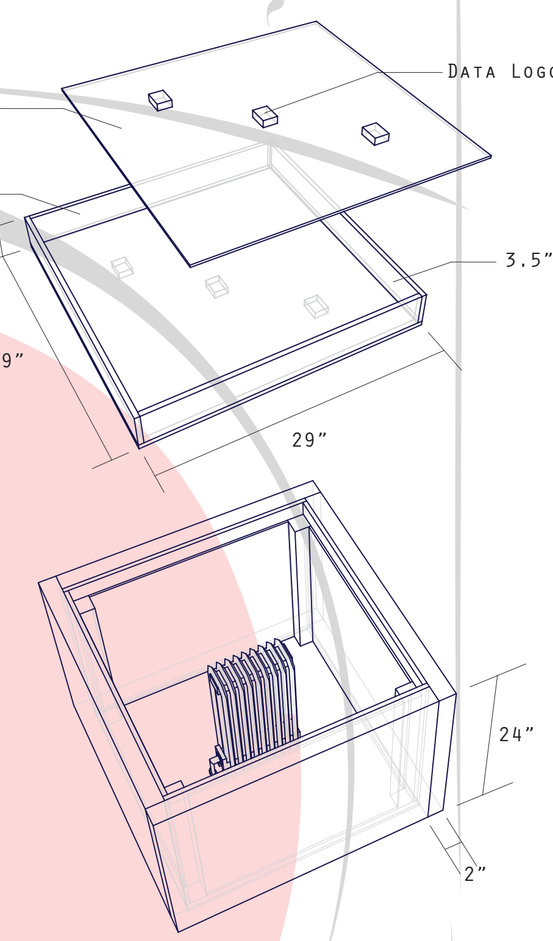
"We got eight more of these to go?"



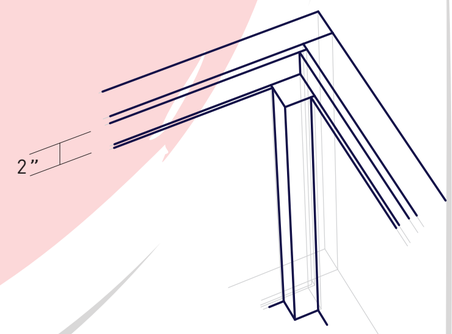
Keep it Hott!

Inside look.

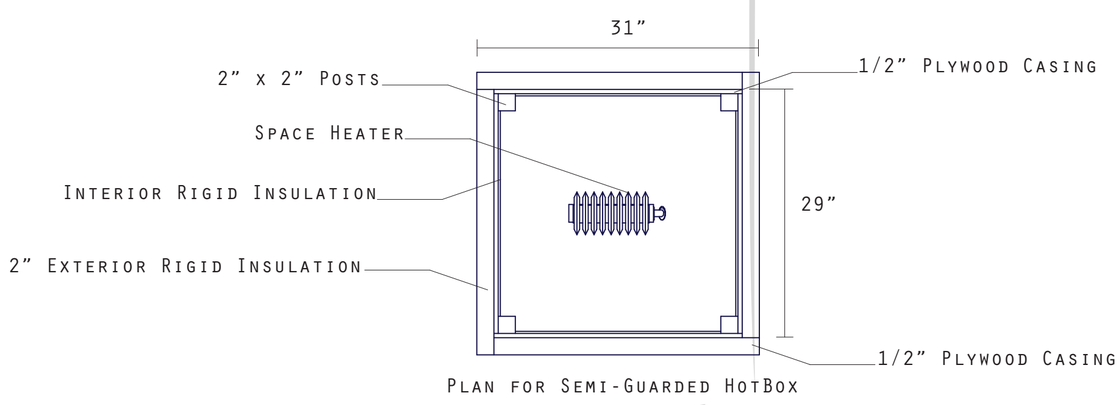
Not a Radiator.



Axon Perspective of Semi-Guarded HotBox



Note - Leave a 2" gap between the top of the 2"x2"s and the top of the interior rigid insulation and the top rim of the actual heating chamber.



Plan for Semi-Guarded HotBox

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Environmental Control Systems I :: ARCH 491 Winter 2008
Professor Alison Kwok :: GTF Rachel Auerbach

R-15!!!