

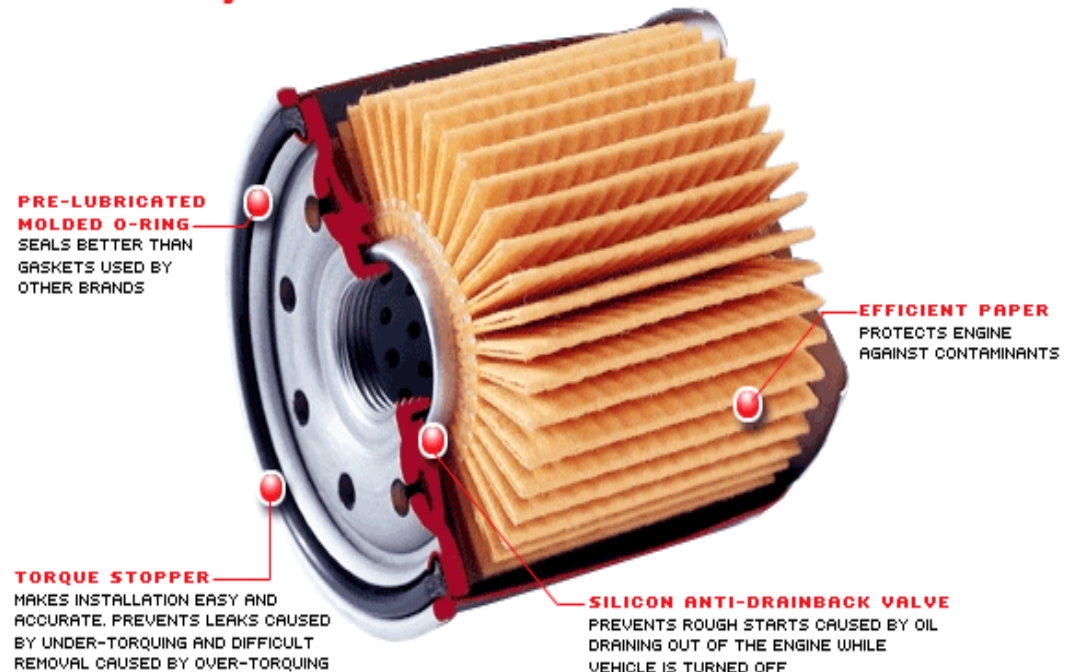
Oil Filter Cleaner

Green A: Sketch Model Review

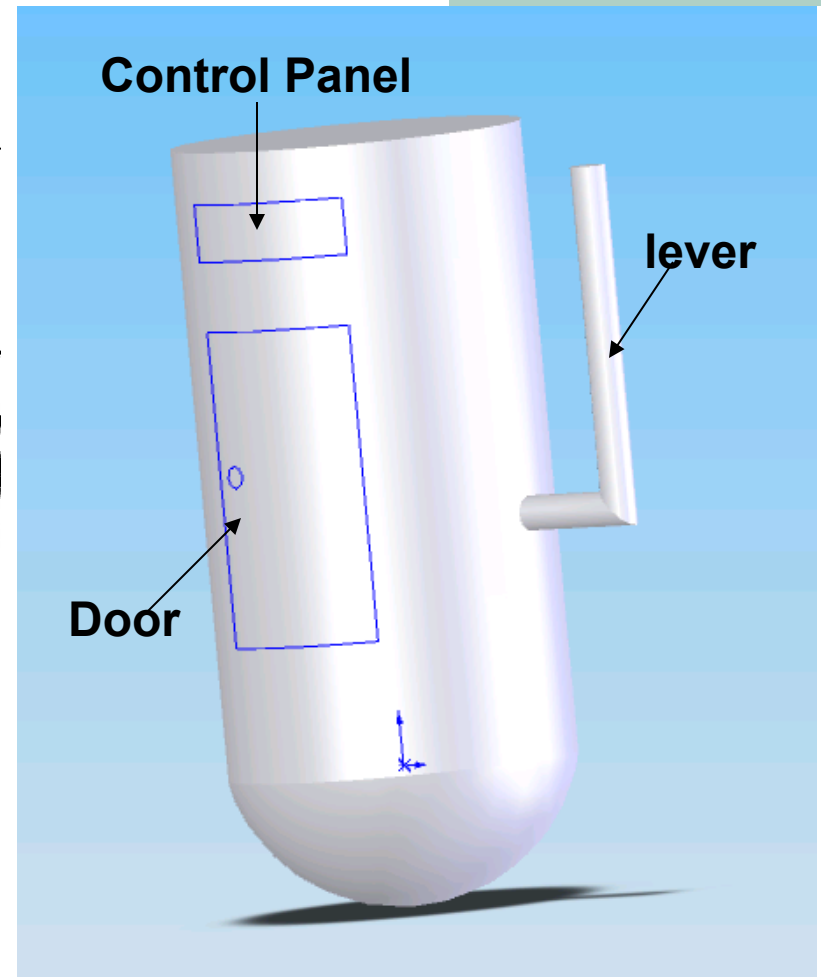
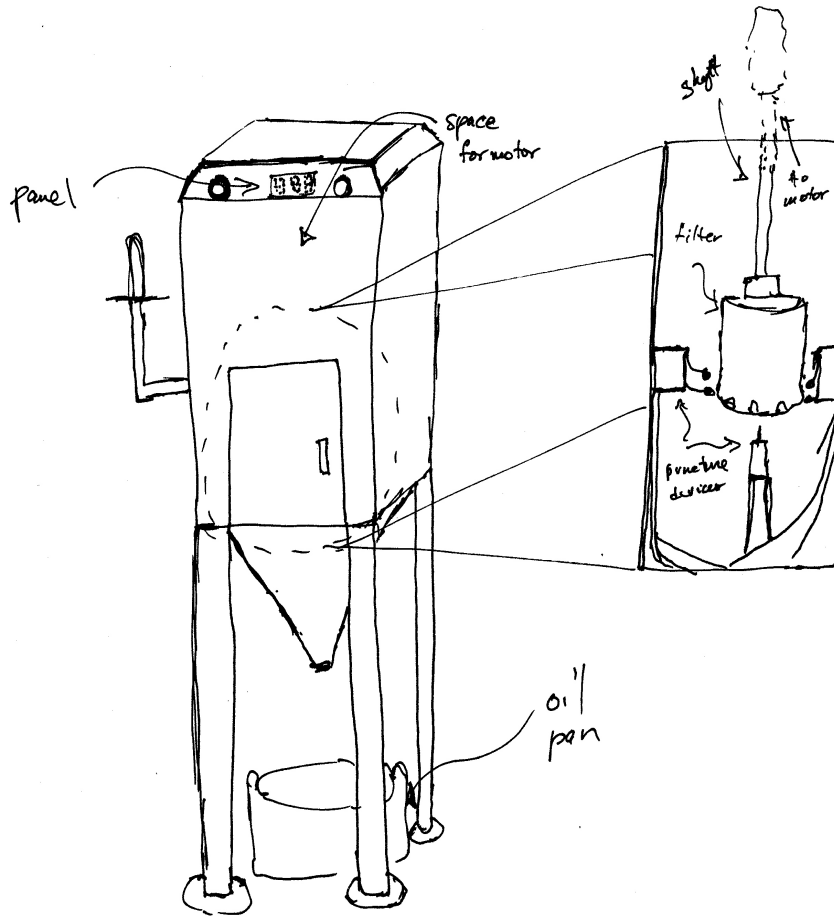
Concept: Oil Filter Cleaner

- Clean oil off of vehicle oil filter through rotating at high rpm.
- Process:
 - Puncture holes
 - Drain oil

Oil Filter Cutaway



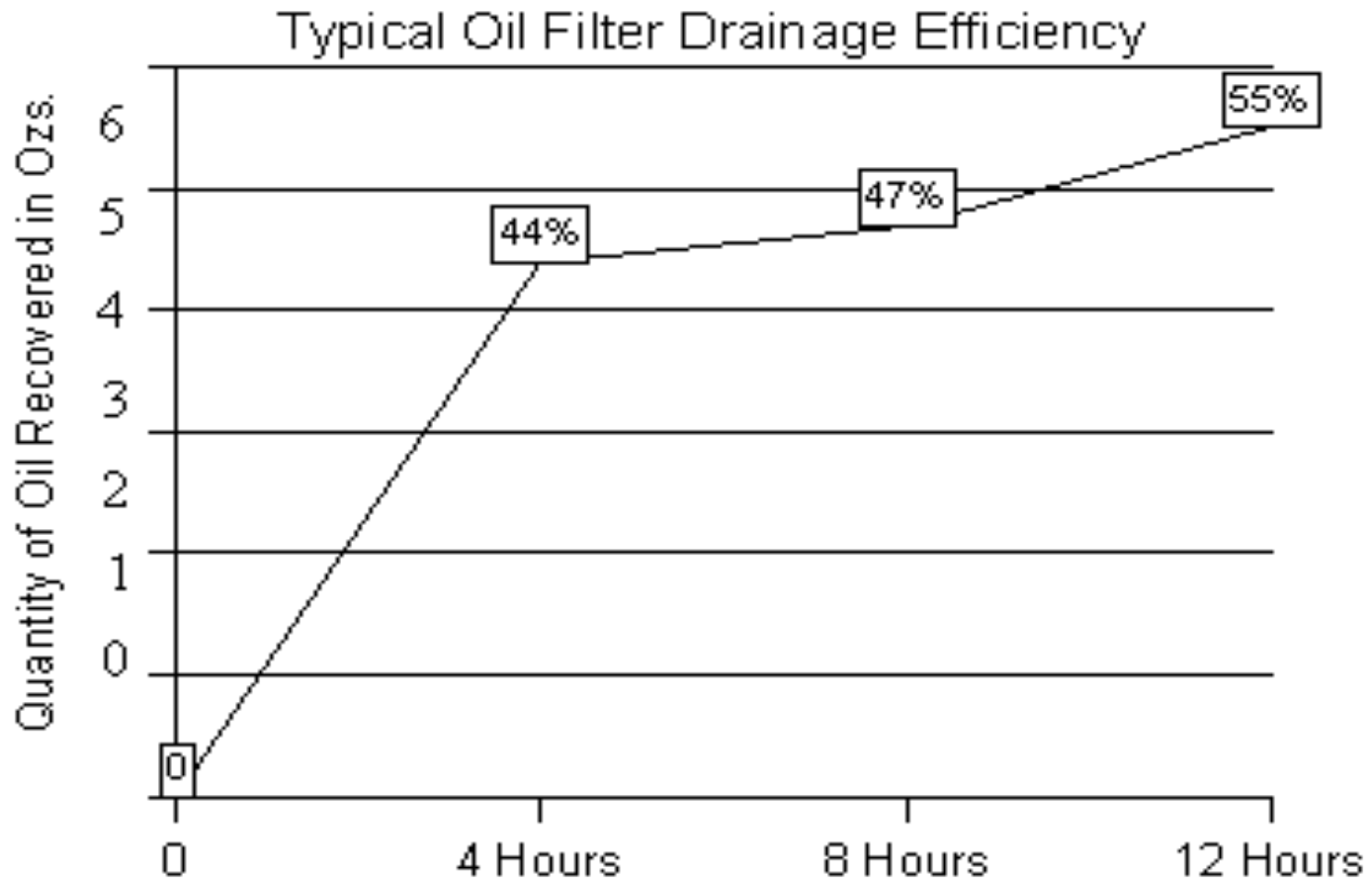
Product Proposal: Filter Drainer



Problem Context

- Less than 25% of all car oil filters are recycled.
- Filters drained overnight by gravity.
- Jiffy Lube changes 50-60 oil filters a day.
- A single used oil filter contains 8 to 32 oz of used oil.
- Over 450 million oil filters are manufactured each year in the US.
- Used oil filters amount to ~5500 tons of steel per year.

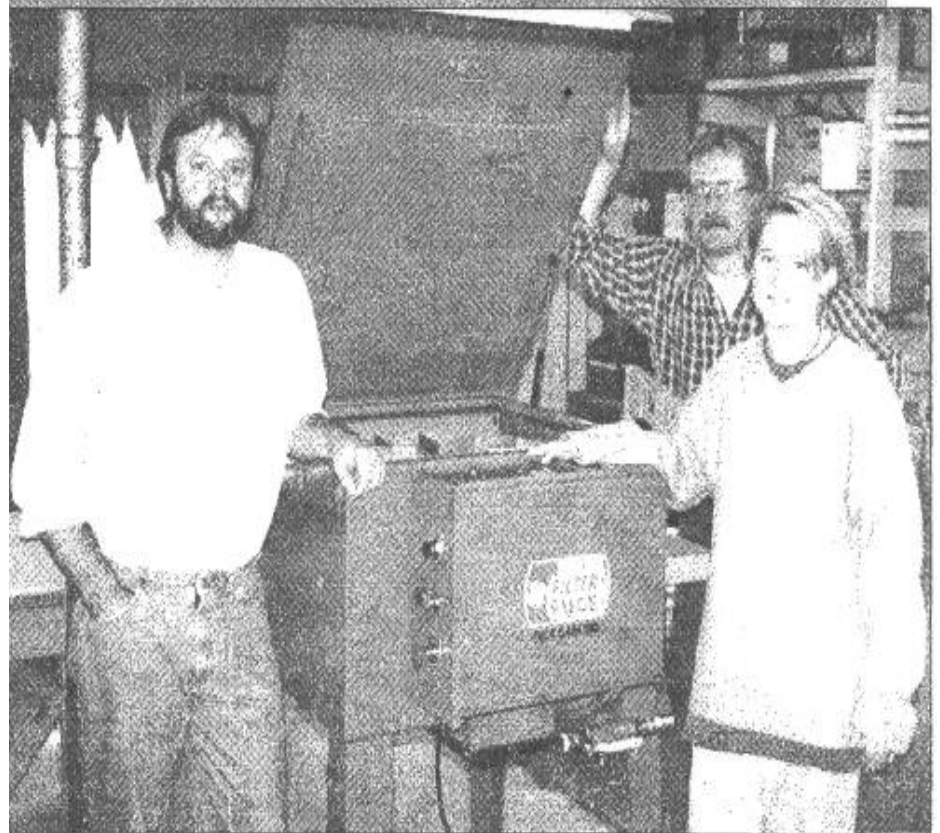
Current drainage under gravity:



Source: Environmental Protection Agency

Initial Concepts

- Centrifuge
 - Pros:
 - Multiple Filters at once
 - Quick
 - Cons:
 - Price
 - **PATENTED!**



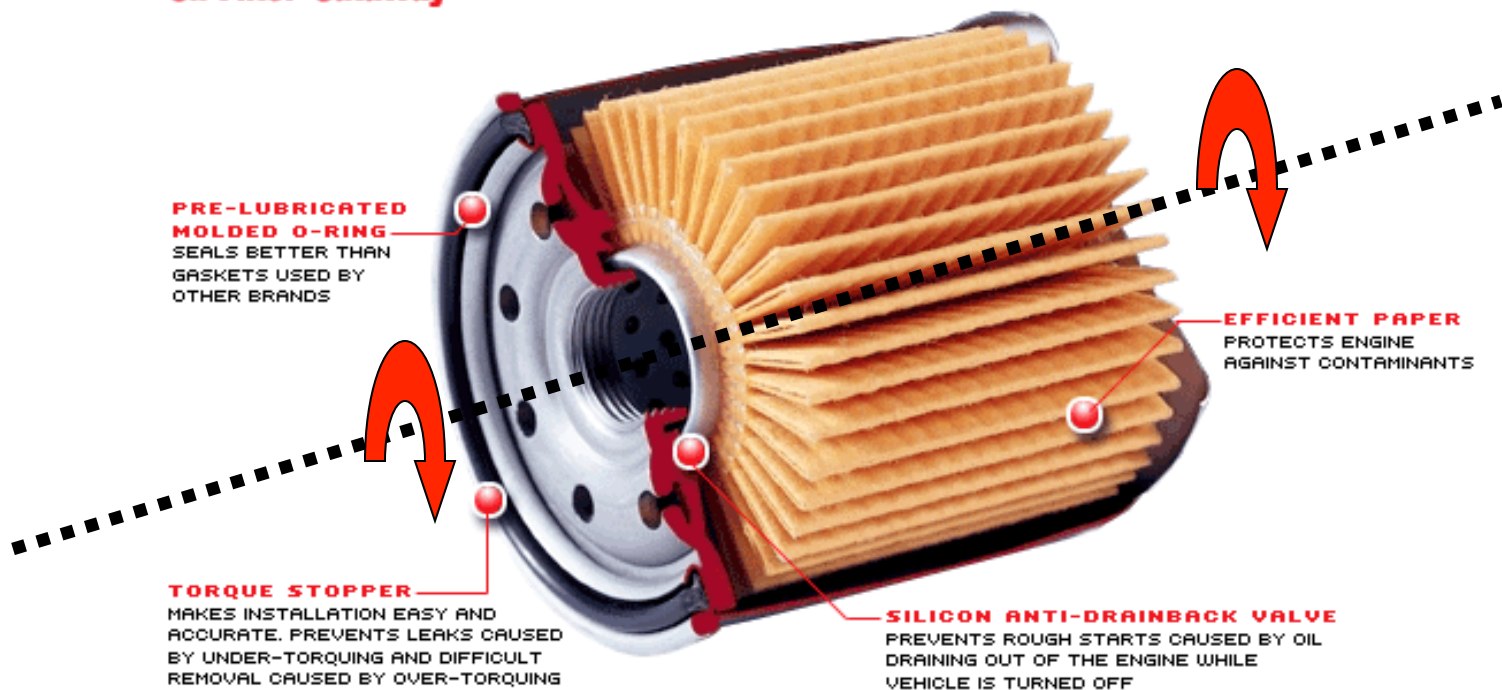
IWRC project staff Jim Olson (left), Rick Klein and Kristi Daniel performed the oil filter tests using centrifugal force units like the one pictured above.

Source: www.turbospin.com

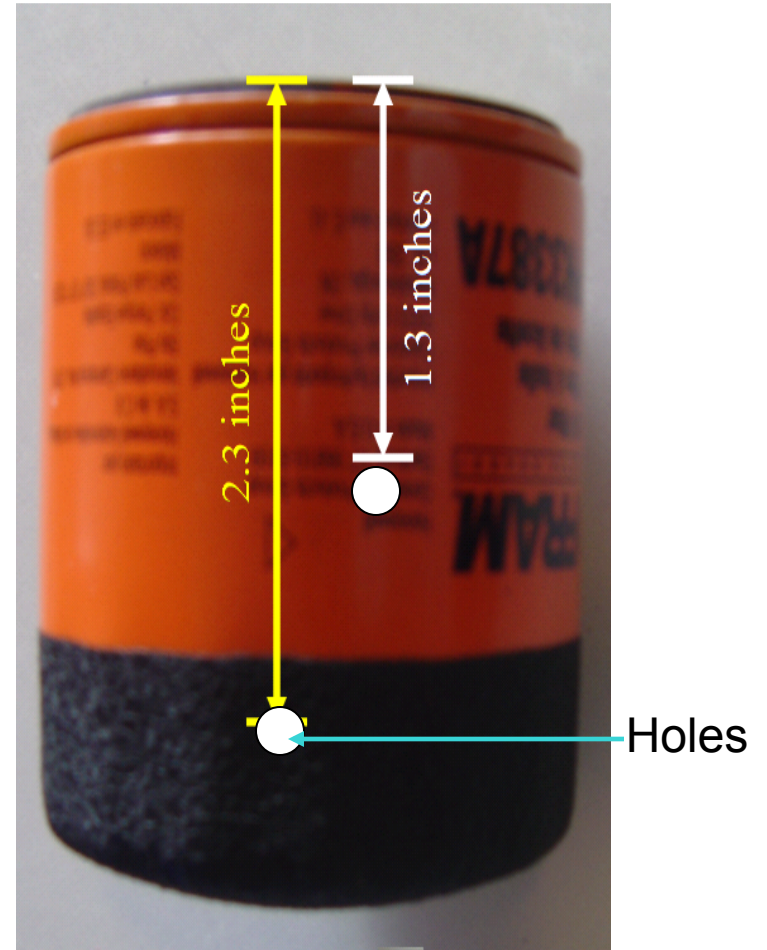
Workaround

- New axis of rotation.

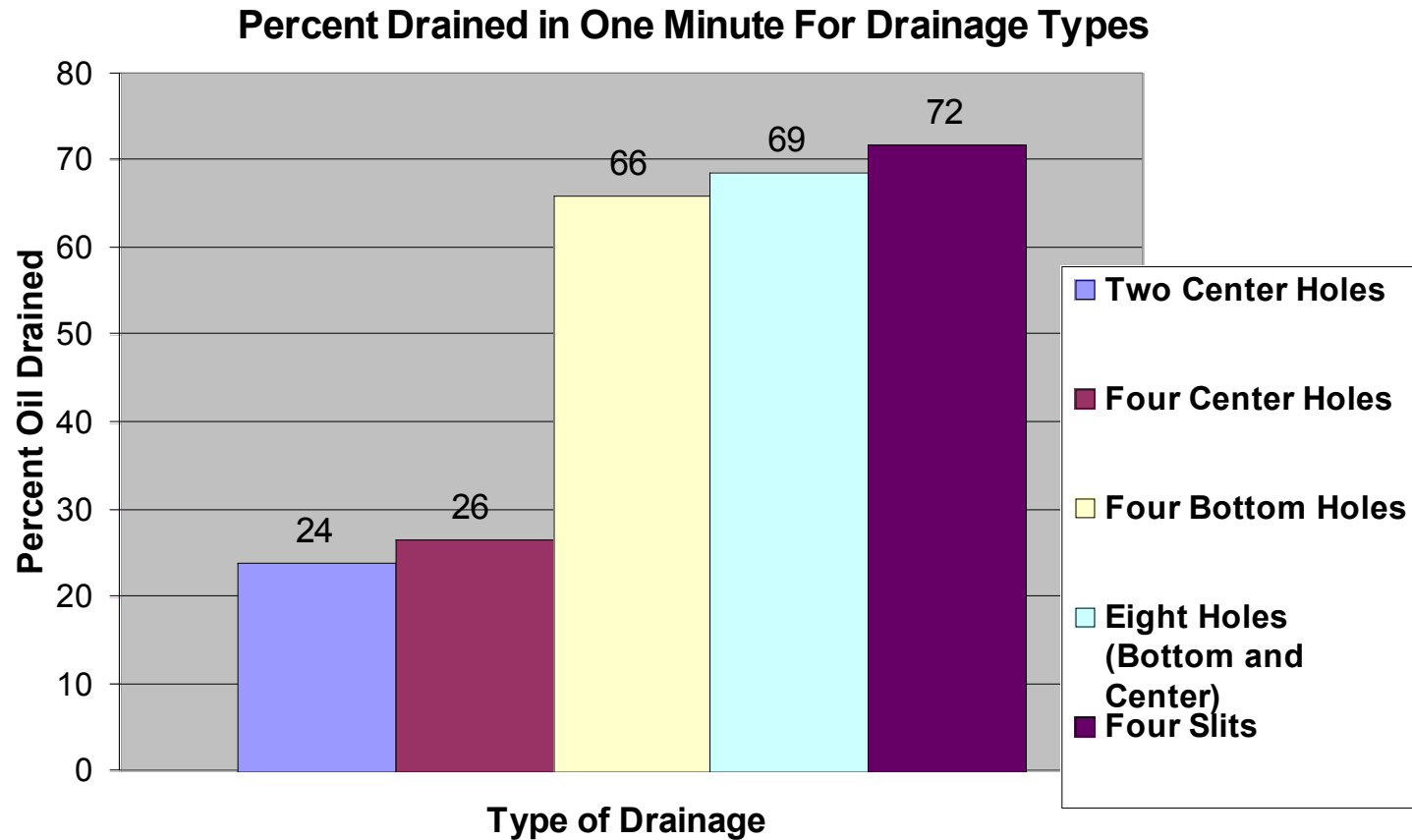
Oil Filter Cutaway



Feasibility Tests

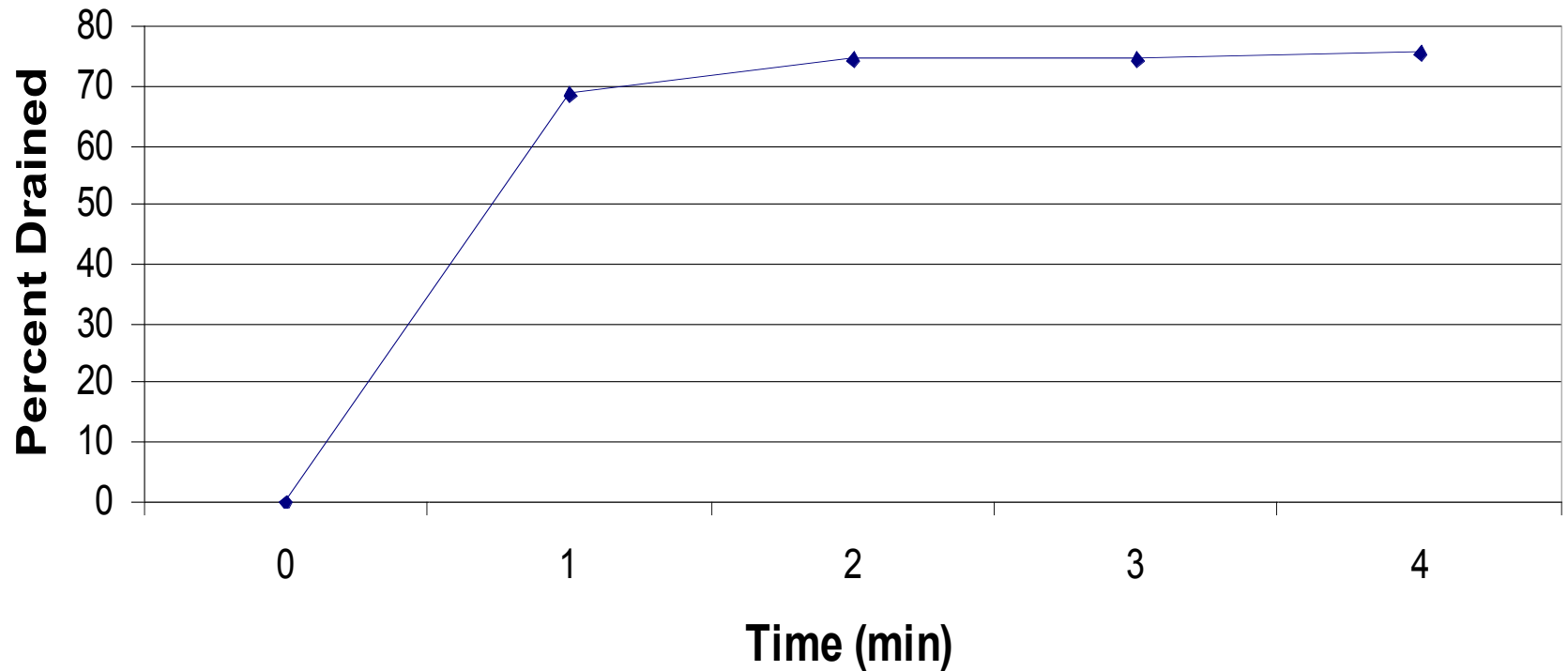


Results: Optimising Hole Location



Results: Drainage

Percent Drained v Time



Next Steps

- Design automated puncture system
- Increase drainage efficiency: faster and more complete
- Interface motor with puncture system and spinning system
- Keep cost < \$700 per unit.
- Minimize space use.

Questions?
