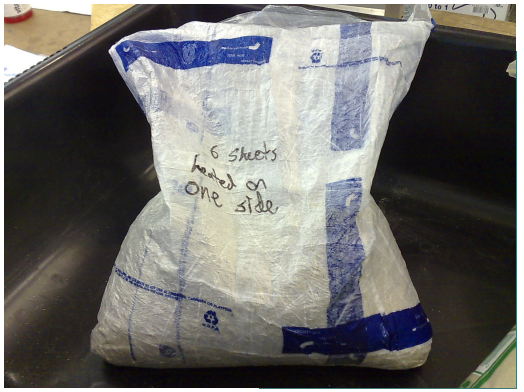
Plastic Bag Rejuvenator

Mock Up Review
Green Team B



Overview

- Workshop Concept
- Key Risks & Challenges
- Test Results
- Benchmarking

Workshop Concept

Rejuvenation.!

Design Specifications

Needs	Attribute	Specs
Add value to plastic bag waste	Safe	Must 130°C<T<300°C Exposed parts must T<50°C
	Uniform output	Should 130°C<T<300°C Stretch variation, lambda<1 Can hold >10lbs of sand .3 PSI<Pressure<.4 PSI
	Affordable product	Start up costs
	Cost competitive material	Output Cost/m^2, <PE raw (ballpark, capital costs) End product cost
Remove and prevent litter	Business model	

Key Risks & Challenges

Challenges

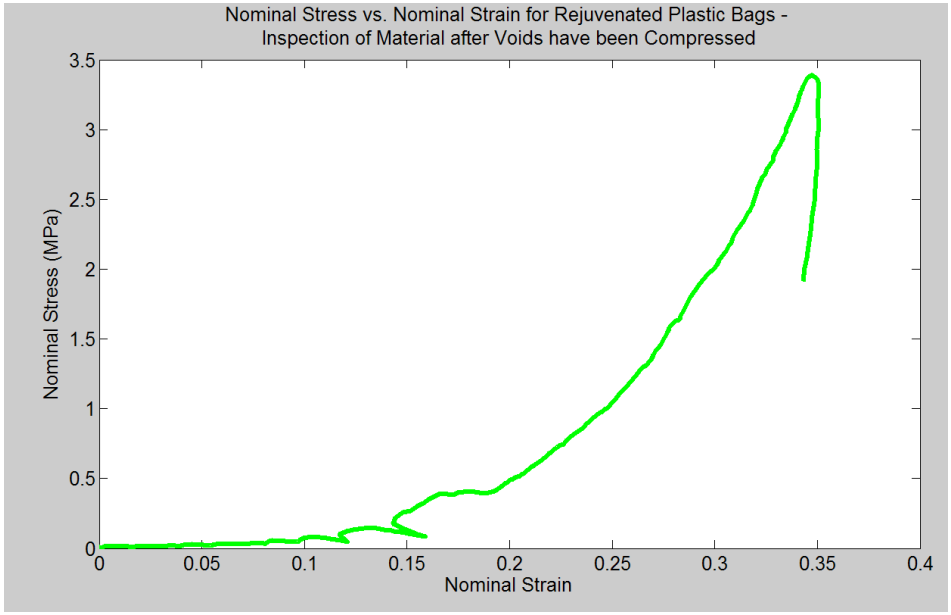
- Material Consistency
  - Degraded/damaged bags
  - Dirty bags
- Material Application
  - Strength
  - Waterproof quality
  - Additives/ Germs

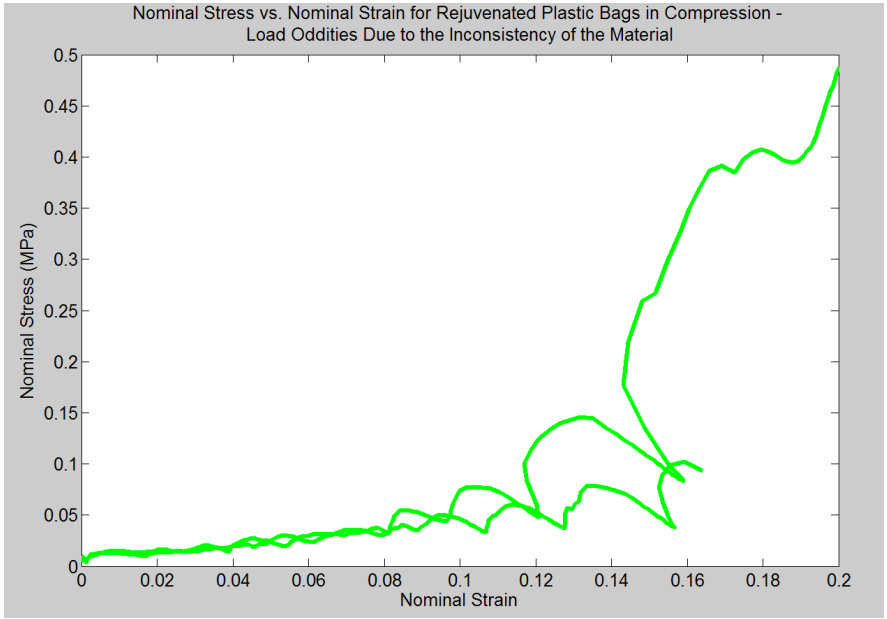
Solutions

- Shredding
- Wash them
- Extensive tests on variables
  - Rollers to eliminate air pockets
  - Pressure
  - Temperature
  - Feed Rate
- Appropriate uses
  - Sandbags
  - Weatherproofing material

Test Results

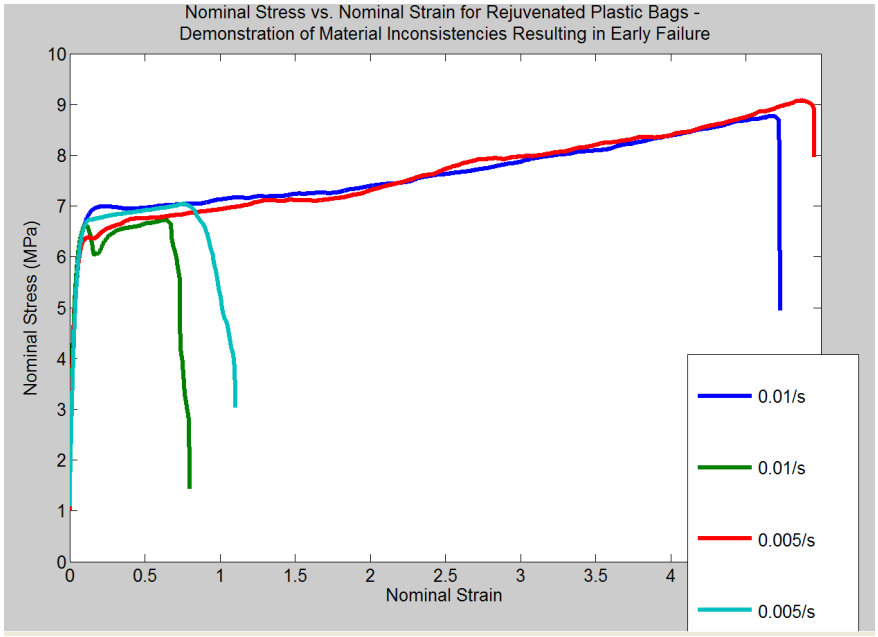
- Compression tests
  - Reveal nonuniform behavior due to air pockets
  - Failure stress lower than for virgin polymer (3.5 MPa vs 10MPa)

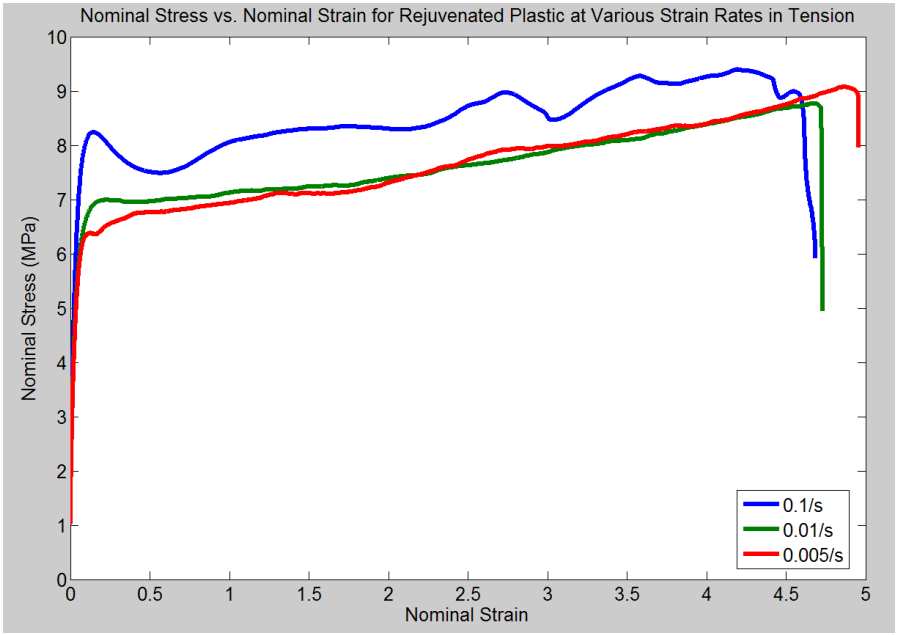




Test Results

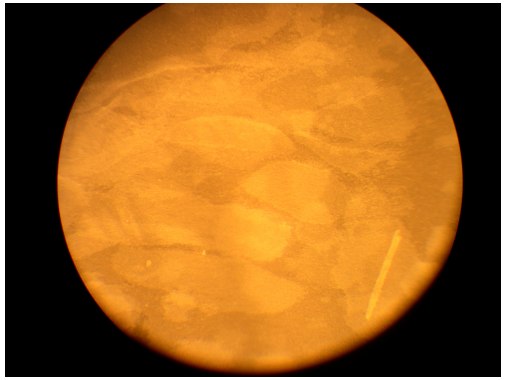
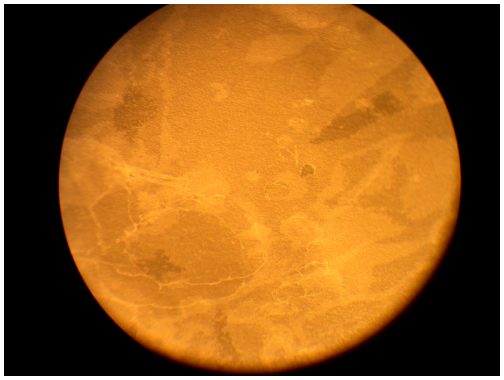
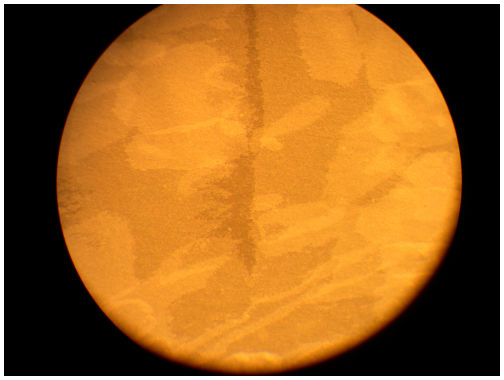
- Tension tests
  - Low yield stress as compared to virgin polymer (7MPa vs ~30MPa)





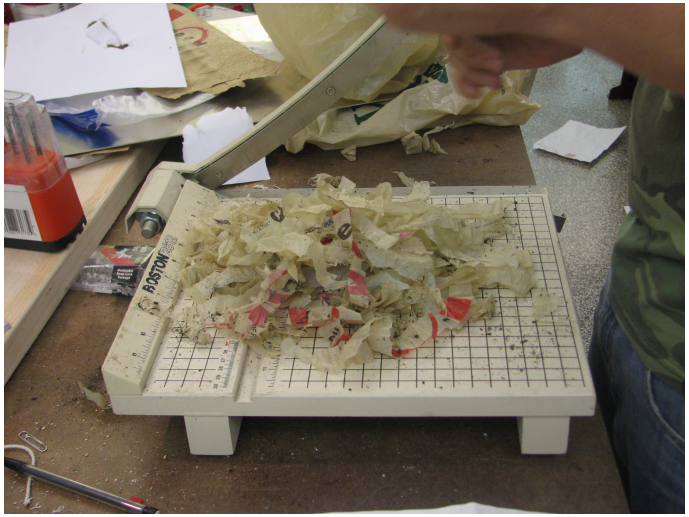
Test Results

- Micrographs of fused bags
  - Reveal material inconsistencies

Test Results

- Bag condition tests
  - Contaminated
  - Shredded
- Temperature and pressure variation



Benchmarking

- Sandbags
  - Current bags made of PP cost $0.20-0.30/bag
  - Burlap bags cost ~$0.40/bag

Benchmarking

- Current uses of laminated sheet
  - CONSERVE in New Delhi
    - Women paid to collect and clean bags
    - Products retail $15.00-50.00
  - Timbuk2 Lamitron
    - Machine costs $100.00
    - Creates 8ft. sheets of plastic
    - Used to create messenger bags