To Predict ▶ To Design ▶ To Perform

College of Engineering
Department of Mechanical & Industrial Engineering

ME, ECE, IE Capstone Design Programs

Project 29: Georgia-Pacific Woodchip Resizer

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Georgia-Pacific

TERRASOURCE GLOBAL

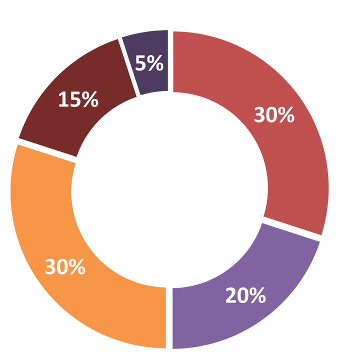
OBJECTIVE

To design and implement a safe, cost efficient woodchip resizing system that enables the customer to make use of rejected, over sized woodchips in the pulping process.

BACKGROUND

- Georgia Pacific currently has a system capable of removing over sized and over-thick woodchips from the pulping line.
- When operational, a chip conditioner is able to reprocess the over-thick woodchips and re-introduce them, however GP has no way to resize the *oversized* woodchips.
- These woodchips are currently being burned as fuel and represent a loss of $390,000 per year.

BUDGET



ENGINEERING SPECIFICATIONS

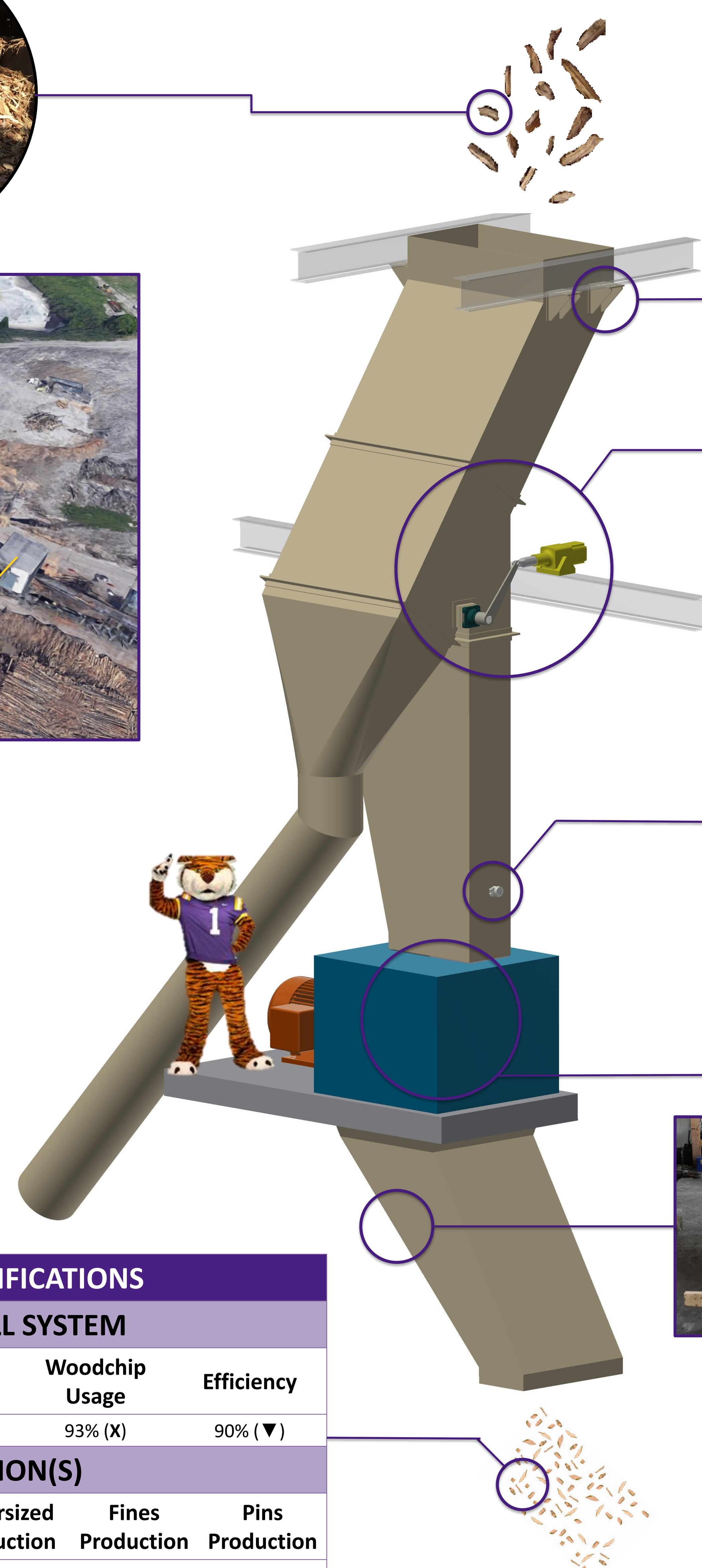
CURRENT/OVERALL SYSTEM

Chip Thickness	Chip Length	Capacity	Woodchip Usage	Efficiency
1/4" (X)	7/8" (X)	50 GTPH (▼)	93% (X)	90% (▼)

SYSTEM ADDITION(S)

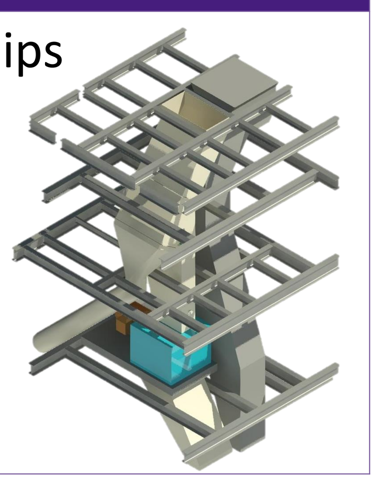
Upfront Cost	Payback Period	Capacity	Oversized Reduction	Fines Production	Pins Production
$500,000 (▲)	10 years (▲)	GTPH (▼)	65-90% (X)	5% (▲)	25% (▲)

▼ - minimum, ▲ - maximum, X - target value



STRUCTURE

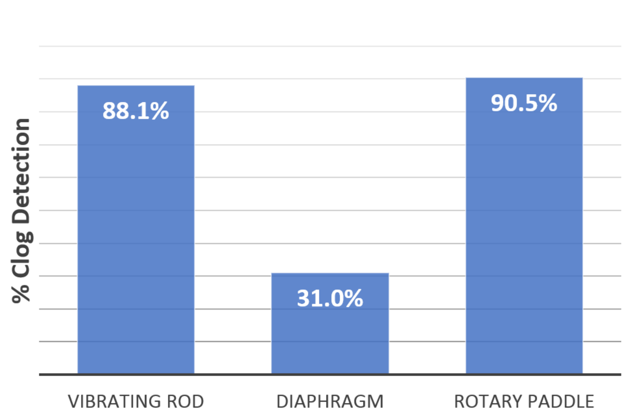
- ✓ Designed for weight when full of woodchips
- ✓ No modifications to existing structure
- ✓ Each chute individually supported
- ✓ Factor of Safeties
  - > 1.5 for chutes
  - > 2 for I-beams (existing and new)
  - > 10 for support lugs



DIVERTER GATE

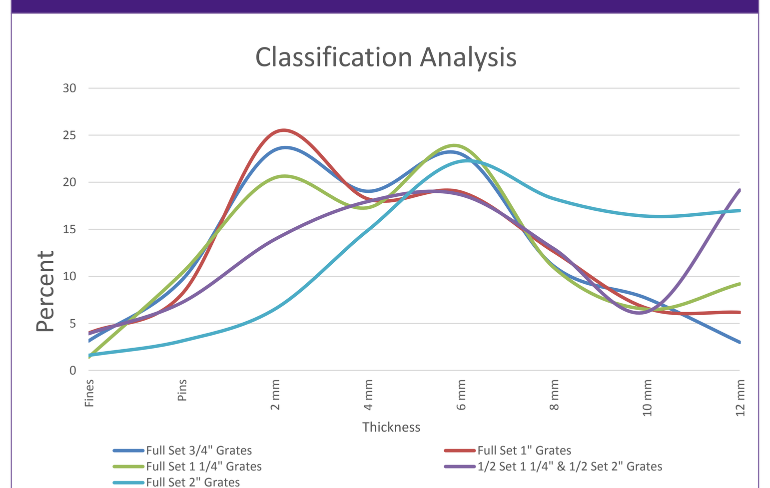
Powered by a linear actuator and activated by a clog sensor, the inclusion of a diverter gate in the design allows the customer to minimize downtime for maintenance.

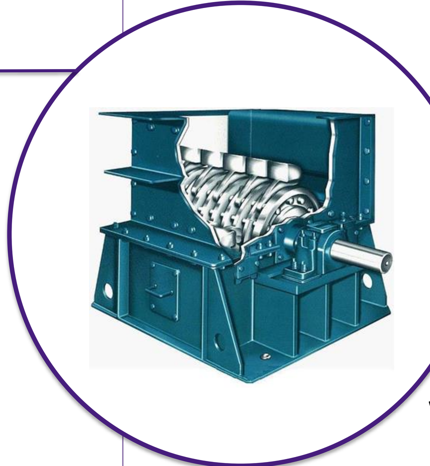
SENSOR TESTING



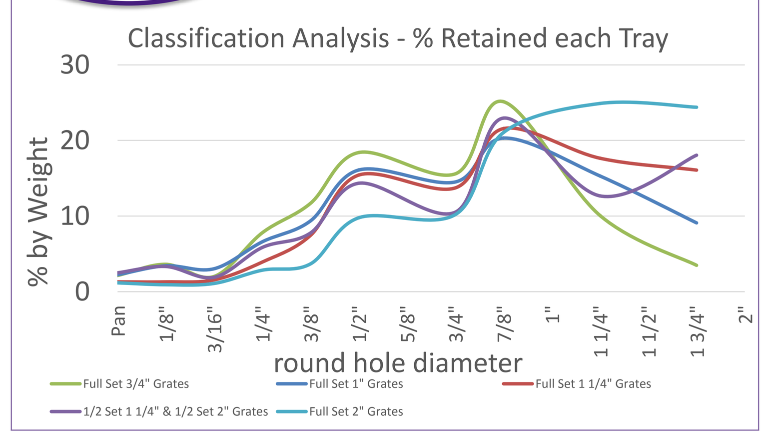
Three clog sensing technologies were evaluated using a test chute to determine the best for use in oversized woodchip chutes.

JEFFREY-RADER 45CS



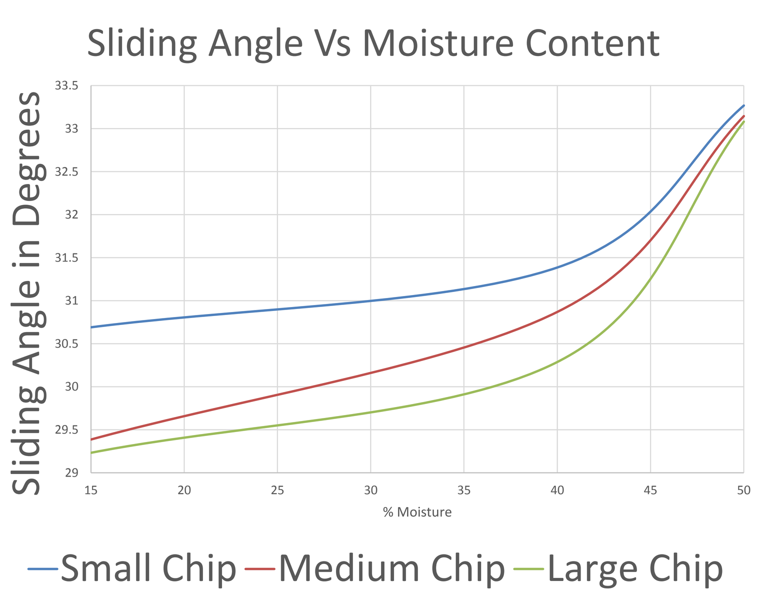


The Jeffrey-Rader Chip-Sizer was tested for performance in resizing GP's oversized woodchips.



SLIDING ANGLE

The minimum chute angle to prevent blockage was found as 33 degrees and is consistent with values for similar applications.



September	October	November	December	January	February	March	April	May

Discuss/Set Constraints – Define Scope of Work – Select Chip-Sizer – Design Chutes – Finalize Design – Present Proposal – Develop Testing Plan – Design Testing Apparatuses – Test – Prove Concept – Submit Findings – Graduate

Sponsor: Jerry Potts

Advisers: Dr. Shengmin Guo