

Team #26 "Cross-Cutting Tools"

Douglas Hoy, Louis Derosé, Michael Ensminger, Benjamin Miller, Parker Williams

Project Description: The wood products company RoyOMartin's oriented strand board (OSB) mill is experiencing problems on its laminating line. This machine applies Eclipse™ radiant barrier foil paper to the OSB surface and cuts the paper at the seam between boards. Edge peeling during cutting at the seam is the recurring problem.

Project Objective: To reduce the current downfall, or board failure rate of 0.7%

Project Goal: Downfall rate of 0.1%



Since 1923

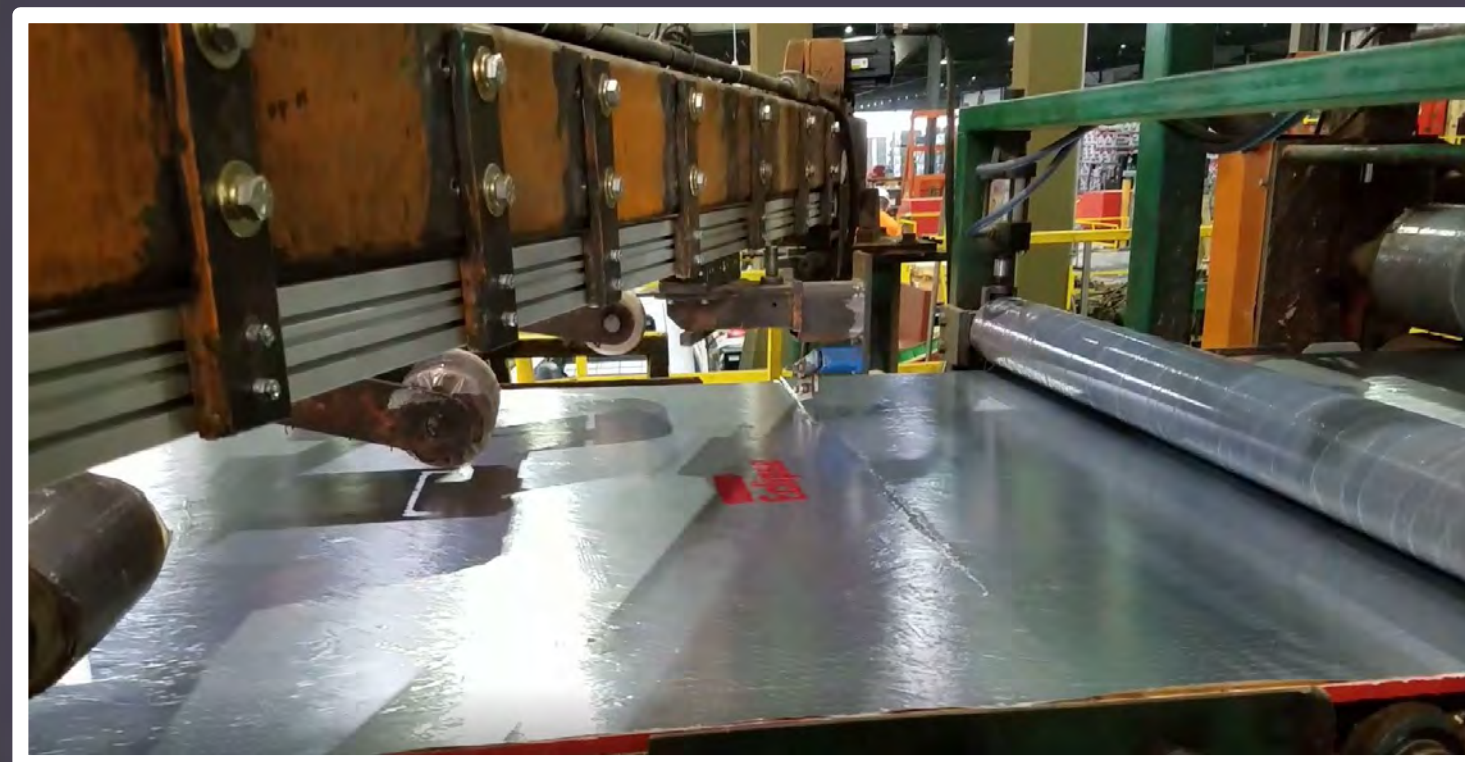
RoyOMartin

OSB & Laminating Line Specifications

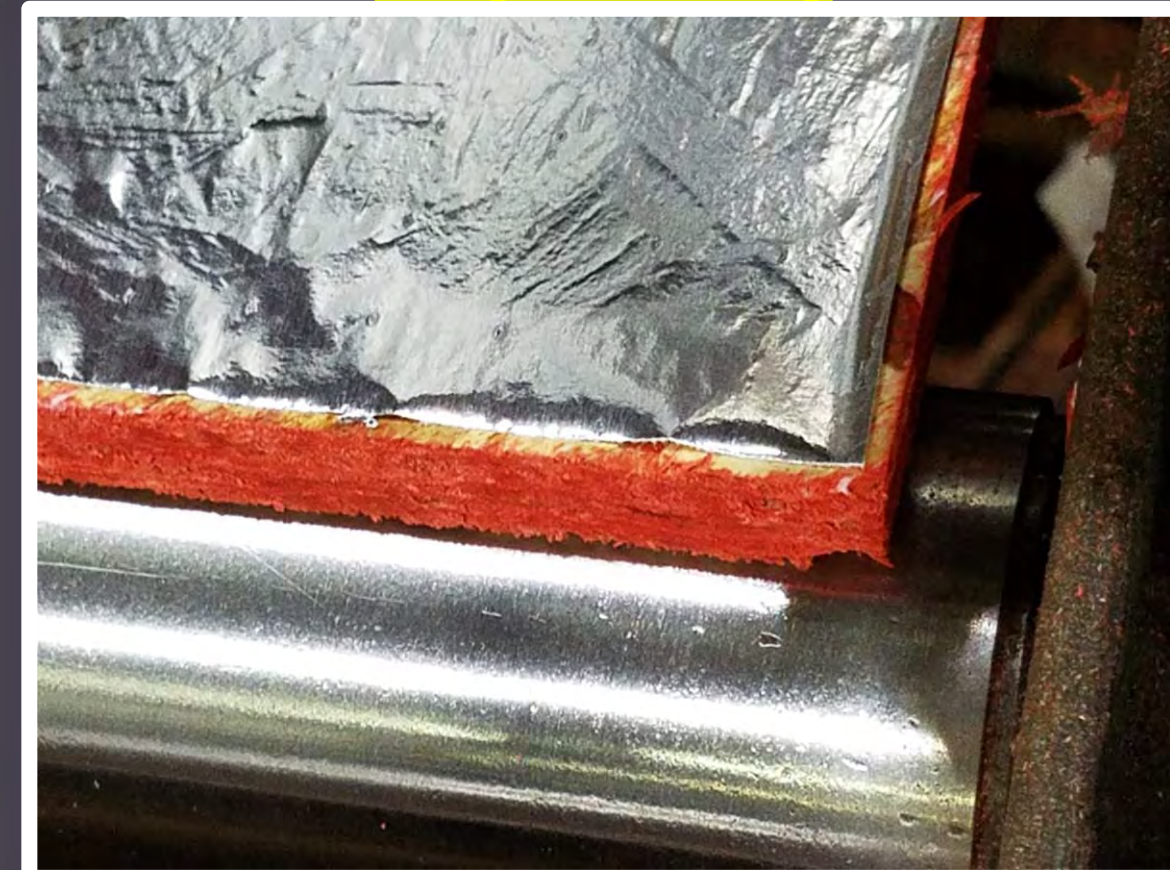
OSB Dimensions: Thickness: 0.416" – 0.438"
Width: 47.9375"; Length: 95.9375"
Production Rate: 1,245 boards per hour

Blade Force (Into Paper & Board Surface): ~2lbf
Linear Board Speed Through Machine: 195 fpm
Distance Traveled by Board During Cut: 17.448"
Cutter Path Angle w.r.t. Board Seam: 20°
Blade Speed Across Board Seam: 8.93 fps
(Speed the Testing Apparatus Blade Must Travel)

Cross-Cut In-Progress



Edge Peeling



Complete Failure



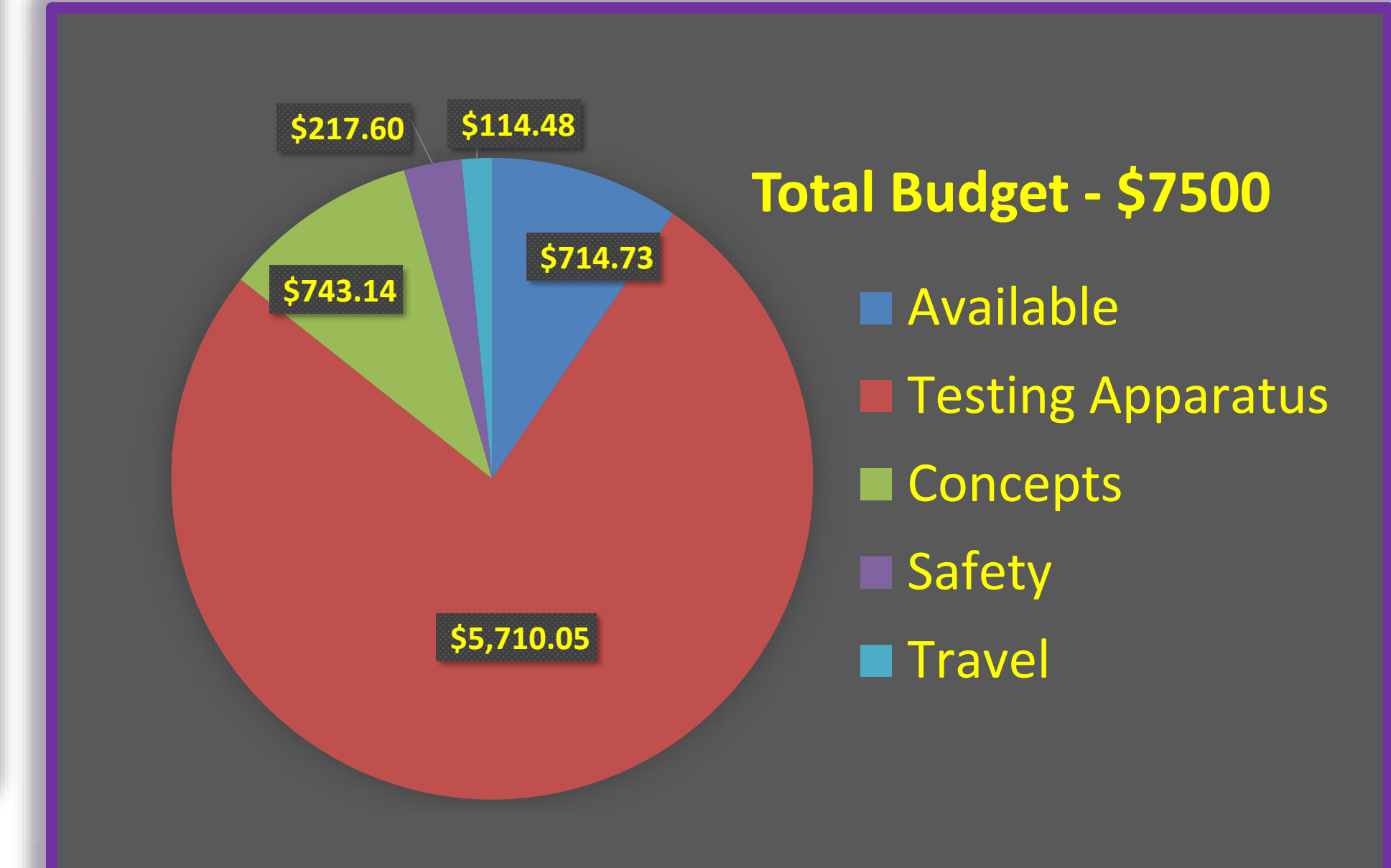
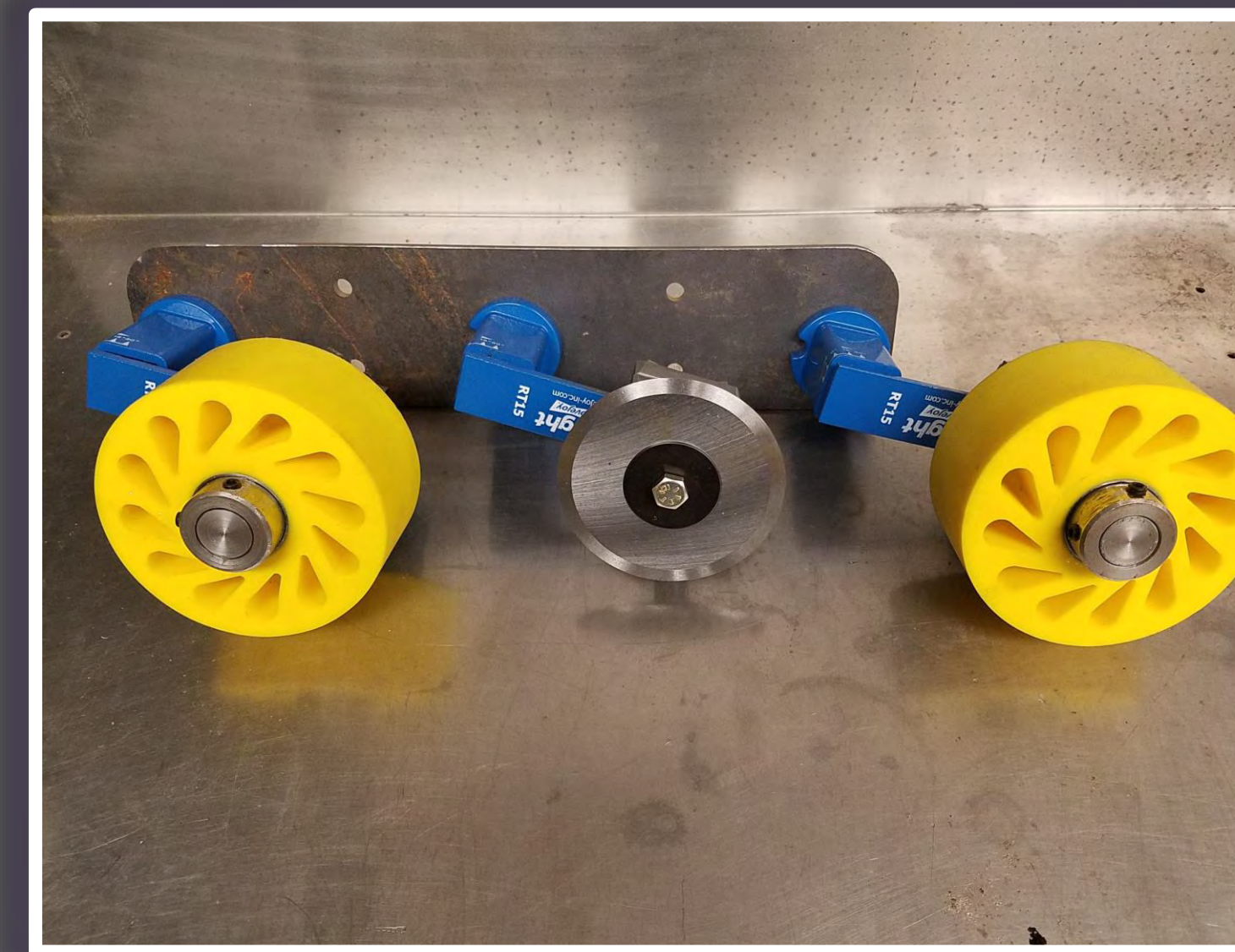
Testing Apparatus



Major Subsystems

1. A36 3" x 3" x 1/4" angle frame;
2. Belt-Drive Linear Motion Guide Rail (96" stroke); Powered by NEMA 34 75VDC 1,383 oz-in High Torque Stepper Motor
3. Carriage Assembly: Adjustable height A36 Hot Roll 1/4" side plates; RT15 LoveJoy Tensioners (providing downward force); Multiple blade options (3.5" OD circular cutter shown above); 4" OD Secondary applicator wheels capable of installation pre-, post-, and during cut; (Shown above in pre- and post-cut configuration)

Concepts



Project Milestones

Objective	Deliverables	Target Dates of Completion	Status
Generate Concepts	List of Potential Solutions to Bring to Testing Phase	10/21/2018	Complete
Design Testing Apparatus	Detailed Drawing, Plans, and Testing Procedures	11/19/2018	Complete
Meet with Sponsor to Present Concepts and Testing Plans	Selected Concepts for Sponsor Evaluation and Approval	12/10/2018	Complete
Build Testing Apparatus	Fully Functional Testing Apparatus	Late January 2019	Complete
Conduct Testing	Analyzed and Evaluated Concepts	February 2019	Complete
Meet with Sponsor to Present Test Results	Test Data for Sponsor Evaluation to Aid in Solution Selection	Late February 2019	In Progress
Create Detailed Drawings and Instruction Manuals	Final Product Design(s)	Early March 2019	In Progress
Construction of Selected Solution(s)	Working Product(s)	March 2019	In Progress
Test Solution(s) in Oakdale Mill	Install Product(s)	Late March - April 2019	Not Started
Reduce Current Downfall Rate of 0.7% to 0.1%	Improved Laminating Line & Cross-Cutter Performance	May 2019	In Progress

Thanks and Recognition

The Team would like to thank our Sponsor for the opportunity to work on this project, and our advisers for their assistance. We would also like to recognize the Oakdale, LA OSB Mill employees Patrick Johnson and Jesse Jones. Their help has been instrumental throughout this process. This process has given us practical experience which we will use in our careers as mechanical engineers going forward. This experience has given us firm ground to launch our careers and confidence to take risk. Without these people this process would not have been possible, we hope it has been as rewarding for them as it has been for us.

Live Purple, Live Gold, Go Tigers!