Investing in a R2R Prototyping Lab as a Means to Reduce the Cost of Innovation.



Steven Dubrule R&D Manager Specialty Films Saint Gobain Performance Plastics Northborough, MA

Roll to Roll Web Coating and Finishing AIMCAL R2R Conference USA 2017 Naples, Florida - October 15th - 18th Saint Gobain R2R Internal Prototyping Lab Northborough, MA



Agenda

- What it is a Prototyping Lab?
- Advantages of a Prototyping Lab
- Characteristics of a World Class Prototyping Lab
- Cost Justification Examples

What is a Prototyping Lab?

- A place to train new personnel
- A place to try new ideas
- A place to fail.
- •All of the above

New Equipment/Process Evaluations

New Equipment/Process Evaluations

• Validations



- 1. Employee Training and Demonstration Center
- 2. Raw Material Qualifications

Raw Material Qualifications

- Throughput Validation
- Prerun Inspection



- 1. New Equipment and Process Evaluation
- 2. Raw Material Qualifications
- 3. Employee Training and Demonstration Center

Employee Training and Demonstration Center

- Centralized Training
- Equipment Demos



Web Cleaning







In-line Web Inspection

System Cleaning

- 1. Employee Training and Demonstration Center
- 2. Raw Material Qualifications
- 3. New Equipment/Process Evaluations
- 4. Late Stage Gated Projects

Late-Stage Gated Projects

- Fail Early
- Understand Scale Up Issues..... Before You Scale Up



- 1. Employee Training and Demonstration Center
- 2. Raw Material Qualifications
- 3. New Equipment/Process Evaluations
- 4. Late Stage Gate Projects

5. Quick Sample Iteration & Pilot Production Capabilities

Quick Sample Iteration & Pilot Production

• Get to Successful Sample Without Adversely Impacting Operations



- 1. Employee Training and Demonstration Center
- 2. Raw Material Qualifications
- 3. New Equipment/Process Evaluations
- 4. Late Stage Gate Projects
- 5. Quick Sample Iteration & Pilot Production Capabilities
- 6. R2R Prototyping Lab is Most <u>Efficient</u> and <u>Cost</u> <u>Effective</u> Method for Achieving Innovation.

Characteristics of a World Class R2R Lab

1. Scalable Processes

Which Extruder Screw Would You Want to Scale Up With?



Characteristics of a World Class R2R Lab

- 1. Scalable Processes
- 2. Capabilities Beyond Manufacturing

http://www.tciinc.com/Capabilities.



Dip

Wire Rod







Knife

Characteristics of a World Class R2R Lab

- 1. Scalable Processes
- 2. Capabilities Beyond Manufacturing
- **3. Well Trained Operators**

Characteristics of a World Class R2R Lab

- 1. Scalable Processes
- 2. Capabilities Beyond Manufacturing
- 3. Well Trained Operators

4. Good In-House Visibility and Controls

Good In-House Visibility and Controls

- Healthy Utilization
- Qualified Leads
- Reasonable Lead Times



Characteristics of a World Class R2R Lab

- 1. Scalable Processes
- 2. Capabilities Beyond Manufacturing
- 3. Well Trained Operators
- 4. Good In-House Visibility and Controls

5. A World Class Lab is User Friendly!

Cost Justification Examples for R2R Prototyping Lab



Cost Justification for 2" Pilot Scale Extruder - \$200K

Based on Material Waste

Project #	Classification	Year	Budgeted Stage 4 Trials	Material Cost/lb	Ave Trial Consumption	Material Waste Per Trial (\$)	Actual Stage 4 Trials	Project Waste
Project 1	New Product	2011	4	11	1200	13200	11	92400
Project 2	New Product	2012	4	9	1100	9900	9	49500
Project 3	Alternative Material Investigation	2014	3	7	700	4900	7	19600
								\$161,500

Cost Justification for 2" Pilot Scale Extruder - \$200K

Other Considerations

- Labor Costs
- Lost Sales from Late Launches
- Opportunity Costs



Courtesy Davis Standard

Cost Justification for a \$20K Slitter Rewinder

• Enable Quick and Efficient Roll Rewind and Inspection



Year	# of Sample Orders	Manufacturing Rate (\$/Hr)	Average Production Time (hr)	Annual Costs (\$)
2013	12	1000	1.1	13200
2012	10	1000	1.3	13000

24" Duplex Slitter with Edge Guide

\$26,200.00

CONCLUSIONS

R2R Prototyping Labs...

- ...Reduce the cost of innovation by enabling sample execution without adverse impact on operations.
- ... With quality scalable equipment, reduce expensive Stage 4 manufacturing trials.
- Are advocated by people like us



QUESTIONS?

Thank you

Steven Dubrule R&D Manager Specialty Films Saint Gobain Performance Plastics Northborough, MA

Roll to Roll Web Coating and Finishing **AIMCAL R2R Conference USA 2017** Naples, Florida - October 15th - 18th

PERFORMANCE PLASTICS