

### DEFINING



# AUTOMAJON

WITTMANN Group 2023-06

#### UTOMATION IS...

**Automatically controlled** operation of an apparatus, process, or system by mechanical or electronic devices that take the place of human



labor. (Merriam - Webster)





#### **AUTOMATION IS...**

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The technique, method, or system of operating, or controlling a process by highly automatic means, reducing human intervention to a minimum. (www.dictionary.com)





#### **AUTOMATION IS...**



# The use of machines and computers that can operate without needing human control.

(Cambridge English Dictionary)





### GETTING THERE...

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- Purpose
- Scope
- Specifications

- Reduce labor
- Reduce waste
- Improve consistency
- Reduce injury
  - Process target
  - # colors
  - Resin source
  - Recipe ID
    - Batch weight
    - Timing
    - Physical limitations
    - Resin tracking





#### GETTING THERE...

*Willmann* 

- Process
- Equipment
- Layout

- What does it need to do
- How does it need to do it
- Why does it need to do it
  - Specifics
  - Controls
  - Accessories
  - Installation
    - Where does it need to go
    - How does it need to fit
    - Physical limitations
    - · What is required





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# GETTING THERE. DISCOVER



- Efficiencies
- Savings
- Success

- How has it reduced labor
- How has it saved resin
- How has it improved process
- How much labor has been saved
- How much resin has been saved
- What are the process improvements
- Labor redirection
- Resin savings
- Improved process
- Return on Investment





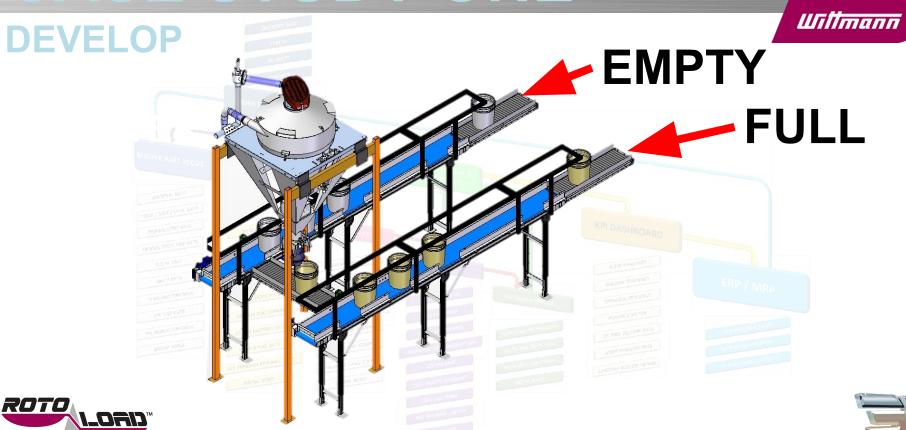
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#### **DEVELOP**

- Small Bucket Filling System
  - Mount the equipment overhead
    - Need 1 primary colors
      - Bucket feeding directly FROM and TO elevated machine platform
- R.F.I.D. Tag Recipe ID
  - Glued to the bottom of the pails
- 12 Batches Per Arm
  - 6 molds on each side of the arm
- Variable Batch Weights
  - 1lb 18lbs





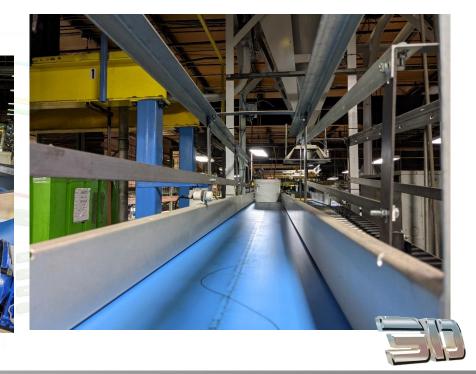


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#### **EFFICIENCIES**

- Resin boxes can be relocated outside of production environment.
  - Filling pre-programmed RFID buckets ensures consistency and accuracy.
    - No manual handling of powder.
      - Labor can be redirected to other profitable tasks.





**DISCOVER** 



#### DIRECT LABOR SAVINGS

- @ 10 lb batches
  - 12 per arm x 3 arms/hr = 36 batches per hour.
    - 45 seconds per pail (manual)
      - 27 mins per hour.
        - 3.6 hrs per shift.
          - 3 shifts / 5 days.
            - 15 shifts x 3.6 hrs
              - 54 hrs per week.
            - 50 weeks per year.
  - 2,700 hrs per year SAVED!



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**DISCOVER** 



### DISCOVER IN-DIRECT LABOR SAVINGS

- @ 10 lb batches 36 batches per hour = 360 lbs/hr
  - 1 resin box emptied every 2.7 hrs
    - 15 mins per box = 30 mins per shift for removal and replacement of the resin boxes
      - 3 shifts / 5 days = 15 shifts x 30 mins = 450 mins per week
        - 375 hrs per year delivering boxes to ONE machine







# DISCOVER DIRECT and IN-DIRECT LABOR SAVINGS

- 2,700 + 375 = 3,075 saved hours
  - 20.00/hr average labor rate
    - \$ 61,500.00 in saved labor
      - Equivalent savings of +/- 1.5 GRUMPY resin handlers!







#### DISCOVER

# OTHER RELATED CAPABILITIES



FULL DATA COLLECTION on every bucket.

- DATA TRACKING of every RECIPE
  - ACTUAL RESIN CONSUMPTION data.
    - LINKABLE with MRP / ERP systems.





## HOW DO WE MEASURE DISCOVER SUCCESS?



- Less labor in the process saving 1.5 people for 1 machine
  - Better part consistency = less scrap
    - Cleaner manufacturing space No powder in manufacturing space
      - Less factory traffic less delivery of boxes to machines





#### **ALTERNATE SOLUTIONS?**



 Multiple materials – Multiple Recipes (RFID)... FROM – TO multiple service platforms



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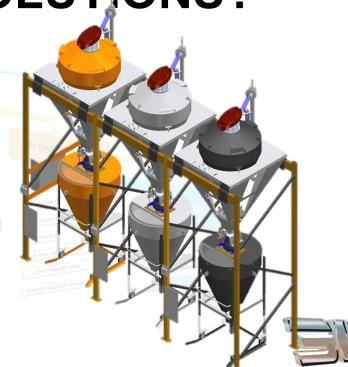
#### **ALTERNATE SOLUTIONS?**



 LARGE VOLUME tote filling.

- BAR CODE recipe generation
- FOOL PROOF material protection.







#### **ALTERNATE SOLUTIONS?**









#### **ALTERNATE SOLUTIONS?**

**DISCOVER** 



\$ 112,000.00 in saved labor

Equivalent savings of +/ 2.8 GRUMPY resin
 handlers!







#### **DEVELOP**

- Direct Filling of Molds
  - 6 CAROUSEL MACHINES
    - Mount the equipment overhead
      - Need 3 primary colors
        - Fill CLOSED MOLDS through a FILL PORT /ACCESS HATCH

#### Bar Code RECIPE Selection

- BAR CODE mounted to molds, wireless hand-held scanner
- 12 kg 35 kg Batch Weights
  - 1 mold on each side of the arm





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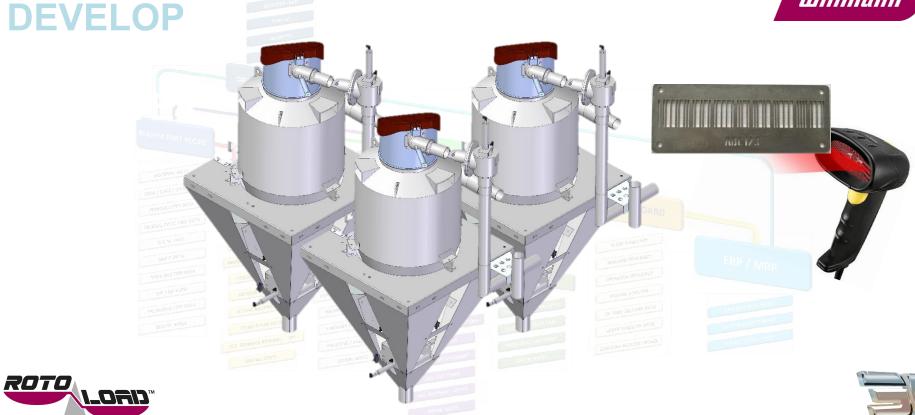
#### **DEVELOP**

- 100 kg capacity ROTOLOAD
  - Three units
    - Telescopic discharge tube
      - Baffle nozzle with pushbutton
        - Direct to mold FILLING
  - SS Bar Code Tags
    - Mounted to mold
- Mount Just Outside of JIB Swing
  - Hang/Support from BUILDING STRUCTURE -OPEN WEB joists







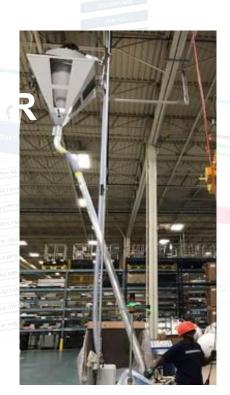


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**DESIGN** 





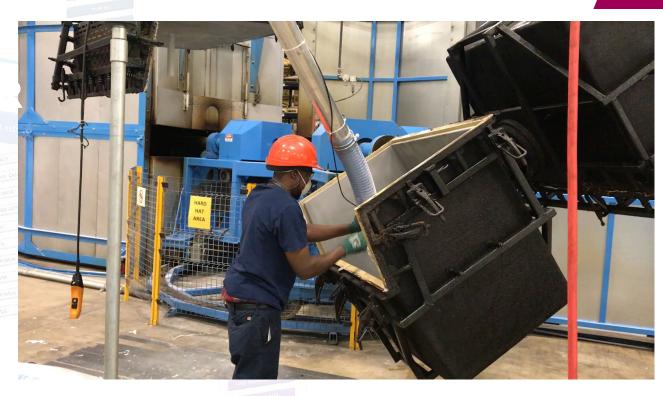




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**DESIGN** 







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#### **EFFICIENCIES**

- All buckets gone from the floor and the platform
  - Resin boxes can be relocated outside of production area – CENTRAL MATERIAL KITCHEN.
    - No manual handling of powder.
      - Filling through FILL PORT eliminates powder contamination on the parting line.
        - Labor can be redirected to other profitable tasks.





#### DIRECT LABOR SAVINGS



- @ 50lb batches 6 batches per hour = 12 x 25lb manual pails per hour PER MACHINE
  - At 90 seconds per pail = 18 mins per hour
    - 2.4 hrs per shift PER MACHINE
      - 3 shifts / 5 days = 15 shifts x 2.4 hrs = 36
         hrs per week PER MACHINE
        - 50 weeks per year = 1,800 hrs per year SAVED for manual filling of pails
          - PER MACHINE



#### IN-DIRECT LABOR SAVINGS





- @ 50lb batches 6 batches per hour = 300lbs/hr
  - 1 resin box emptied every 3.5 hrs
    - 15 mins per shift for removal and replacement of the resin boxes
      - 3 shifts / 5 days = 15 shifts x 15 mins =
         225 mins per week
        - 187 hrs per year delivering boxes to ONE machine.
          - X...SIX MACHINES



# DIRECT AND INDIRECT DISCOVER LABOR SAVINGS



20.00/hr average labor rate

\$ 39,740.00 in saved labor...

#### **FOR EACH MACHINE**

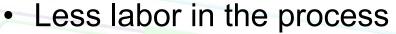
 SAVE 6 GRUMPY MATERIAL HANDLERS!!



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# HOW DO WE MEASURE SUCCESS



- Better part consistency = less scrap
  - Cleaner manufacturing space
    - Less employee injury
      - Less factory traffic
        - FULL DATA TRACKING CAPABILITIES RESIN MANAGEMENT...



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#### Thank you!

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#### Contact us!





Chantal Laflamme
TECHNICAL SALES

Chantal.laflamme@wittmann-group.ca

+1 (416)-678-2893

Rob Miller PRESIDENT

rob.miller@Wittmann-group.ca

+1 (416)-677-7928

