



North American  
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# Gain Efficiency, Improve Uptime, and Increase Precision with Direct Die Injection

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# Direct Die vs. Wet Bath

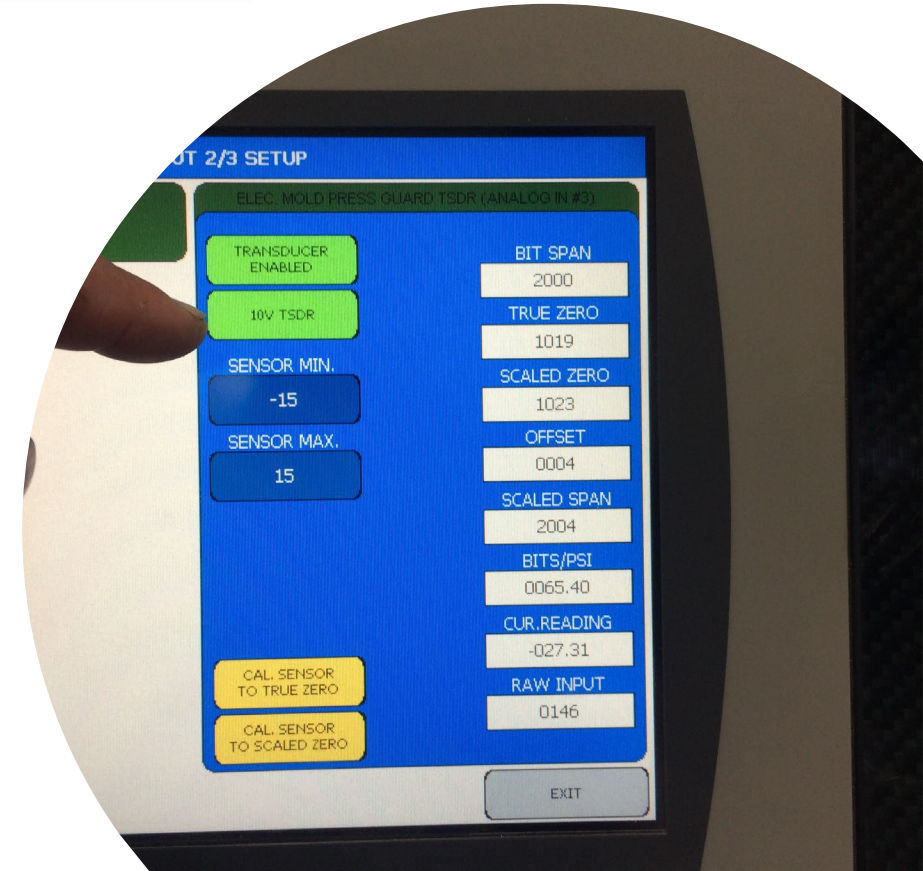
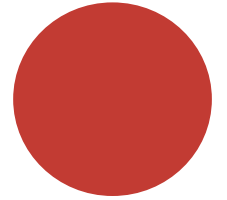


# Accuracy with Material Savings

- Eliminates cleaning of bath and left over material
- Material life cycle longer/shorter since material is not starting the curing process once mixed and poured/pumped into bath
- Adjust cure times/chemistry. Delivering finished product quicker
- Ability to use more variety of materials in production
- Quick change out on the line with materials
- Freshly mixed material being delivered into die
- Reduction in settlement in materials being used
- Cleaner facility
- No hand mixing
- Durable Pumps/Technology

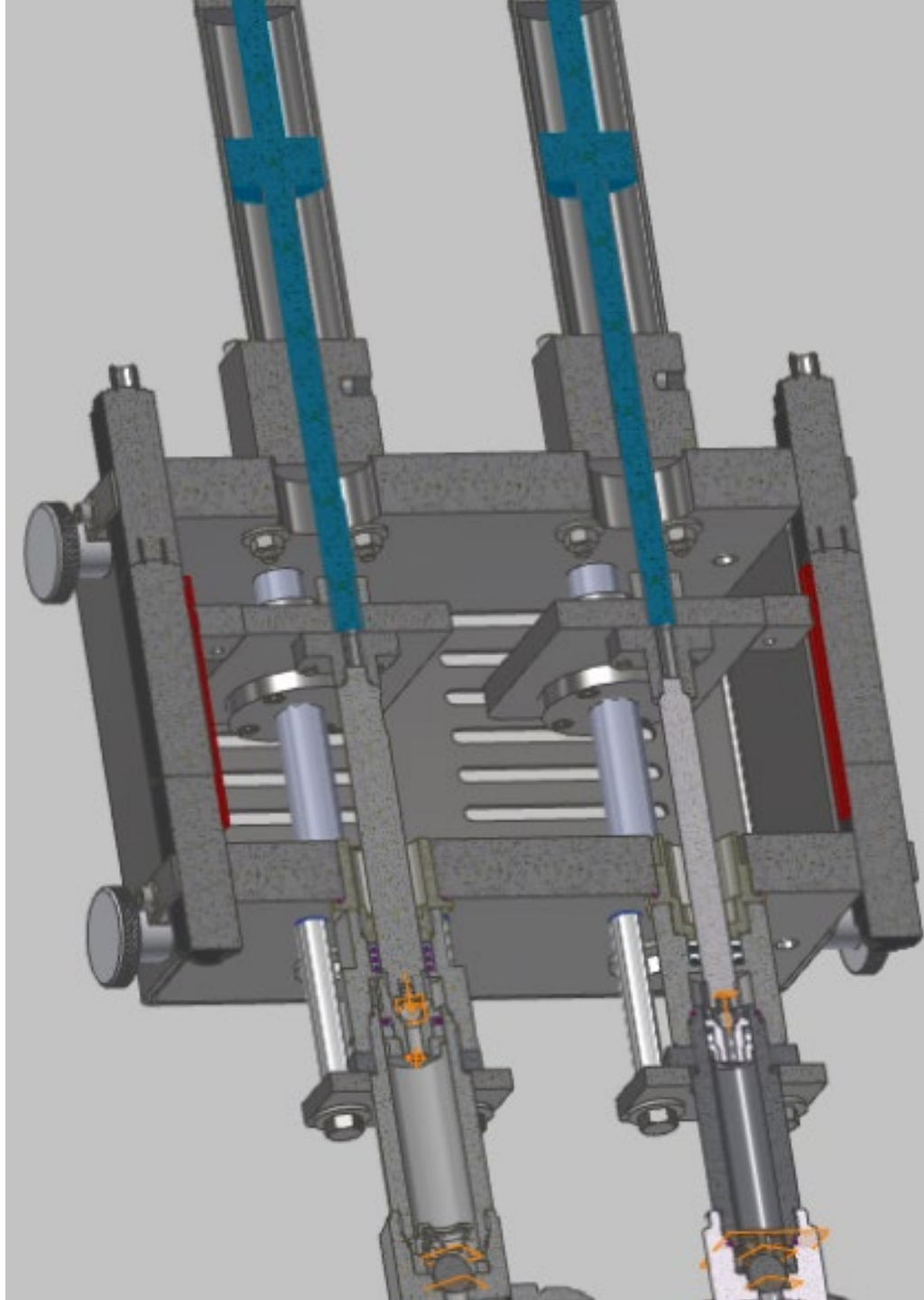
# Pressure Control/Heat Control


- Ability to Control Pressure with Feedback Module (Die and Injection head)
  - Allows for pressure to be self regulated through control system/feedback mechanisms. Technology to speed up or slow down pumps to reach correct pressure ratings
- Injection pressures tightly regulated for no blowouts that can slow down process/ Too low pressure will not get proper saturation
- Allows materials to reduce in viscosity/thin for proper saturation which allows die to apply cure heat on outbound side



# Precision Pumps/Controls

- Hydraulic Driven pumps with backpressure regulators/flow meters smooth out the flow with controlled delivery rates and correct component materials.
- Material Flow Rate is consistent and controlled
- Self Regulates through PLC logic and controls. Can communicate with controls on the pultrusion line
- Data Acquisition
- Technology to be able to adjust ratios on the fly
- Automated to eliminate operator error. Repeatable
- Improved Process Controls (RFID, Barcode, Recipe Control)





# Efficiency Gains/Uptime

- Cleaner/Controlled Environment
  - Repeatable Process
  - Ergonomics for employees
  - Higher Output
  - Increased Production Efficiency
  - Reduction in waste
- Feedbacks/Alarms
  - Machine capability to alarm if off pressure/ratio/temp
  - Understanding exactly what is happening at the die connection
  - Data Logic on Ratios, Operators, Product
  - Remote Login for serviceability
- Reduction in Emissions
- Labor Savings
- Less Rework on finished products