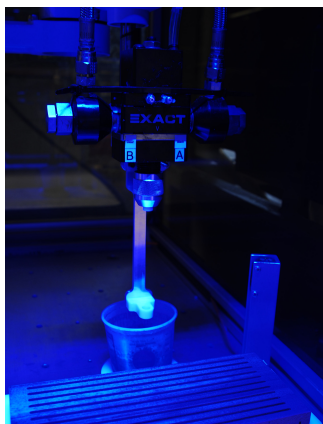


GEAR PUMP METERING DISPENSING SYSTEM AUTOMATES GUITAR ASSEMBLY



APPLICATION:

Taylor Guitar, a leading manufacturer of high end guitars, historically implemented manual methods to affix steel reinforcements into guitar necks for added strength. Besides being messy, the process was cumbersome and time-consuming. To increase productivity while reducing costs, the guitar manufacturer sought to automate the steel neck reinforcement process by using a meter/mix and dispense system to automatically mix and dispense correct amounts of epoxy to bond wood and metal during an automated assembly process.

PRODUCTS SUPPLIED:

- B Series Servo Gear Pump Metering System
- Two servo-controlled precision gear pumps supplied by positive displacement supply pumps
- Stainless steel supply tanks supplied with vacuum degassing apparatus for material conditioning/preparation

CHALLENGE:

A previous dispensing machine mixed but the automation process required a meter-mix system to dispense epoxy at a precision 1-1 volumetric rate with a consistent flow rate ranging from 1/2 to 1 gram per second into 1/8" wide slots of a guitar framework. The two-part epoxy required initial blending then immediate dispensing due to its fast set-up time. Dispense time would be 3 – 5 seconds per batch at appropriately a half second dwell

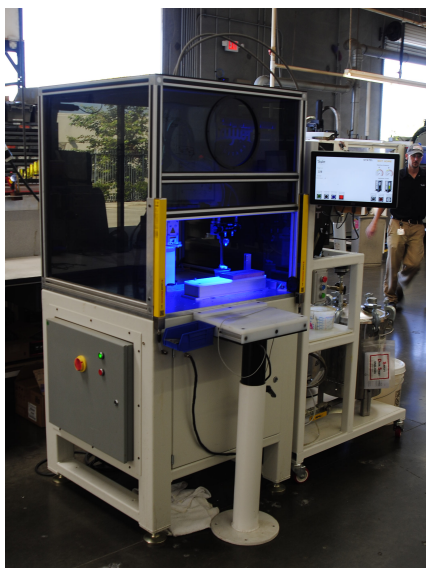
between the first and second bead. With a new part glued every 20 seconds, a one-hour production should produce 180 parts. During the production process, the meter/mix and dispense process must be accurately timed to allow for a proper mix of materials prior to dispense to avoid gel accumulating in the mixer. A consistent dispense rate would avoid a blockage that could slow or even stop operations.

CONCLUSION:

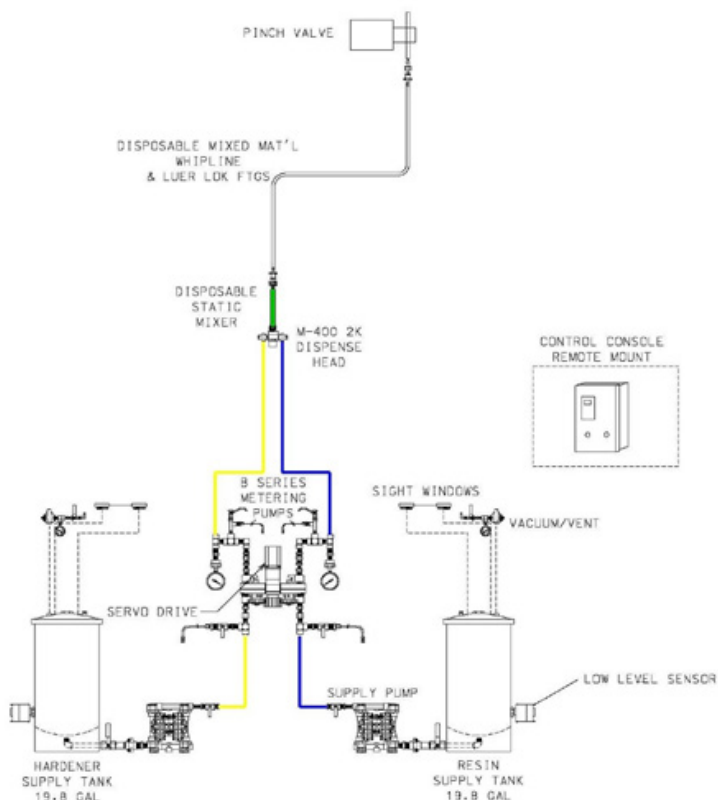
The EXACT B Series Servo Gear Pump Metering System accurately dispenses adhesive at a consistent, repeatable flow under varying viscosities in the newly automated guitar assembly process. Two stainless steel supply tanks located upstream distribute two materials to a pair of positive displacement supply pumps that feed the metering system. The ratio is set by the displacement of the gear pumps that are mechanically linked, ensuring both pumps provide the correct amount of material. (See schematic 1 on back page).

The servo-driven gear pump metering system is particularly suited for automated bead delivery of epoxies, silicones and urethanes as dispense rates remain constant even as material viscosity changes. Other systems with pneumatic drives are unable to maintain flow rates as the static mixer begins to restrict flow. The EXACT B Series Gear Pump Metering System worked as part of the guitar manufacturer's total motion assembly system.

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A multi-day verification test confirmed that the EXACT B-Series Servo Gear Pump Metering System consistently delivers the proper chemistry of the adhesive in the slots of the guitar at the right consistency on a highly repeatable basis. The automated process will reduce secondary finishing and ensure higher product quality at a reduced production expense.



Schematic 1: Configuration of EXACT B-Series Servo Gear Pump Metering System for the automated dispense of exact amounts of epoxy during guitar manufacturing.