

Bonding Composite Golf Club Shafts to Metal Club Heads

BACKGROUND - A few years ago, a major golf club manufacturer in California purchased a large number of name-brand adhesive metering systems. Every 4-hours, the under-powered pneumatic dispensing systems were gummed up and had to be adjusted or stopped running. The customer lost enormous amounts of production time and spent many maintenance hours repairing the systems.

The customer invited other manufacturers to provide a 90-day trial system for review. Sealant Equipment & Engineering provided its **Servo-Flo® 801** servo-motor metering system and after 30 days the customer ordered them to replace his troublesome dispensing equipment.

At the same time, the manufacturer reviewed the shaft-to-head bonding performance and decided to change adhesives to improve product quality, customer performance and production speed. Prior to upgrading their process, the production rate was approximately 1,200 clubs per day. Now, approximately 4,500 clubs per day are produced. As a result of their investment, plus product and process improvements, the manufacturer expects to realize a net cost savings.

MATERIAL - In the past, the manufacturer used a 2-component epoxy and has now converted to a 2-component, 1:1 ratio acrylic adhesive to provide a stronger permanent bond between the head and shaft. The adhesive is heated and cures in approximately 3 minutes.

SYSTEM SELECTION - The manufacturer reviewed his need to improve product quality, manufacturing up-time and production rate and reviewed Sealant Equipment & Engineering's **Micro-Meter 2** product family before selecting the **Servo-Flo 801** to upgrade his manufacturing process. **Micro-Meter 2** series includes: **Servo-Flo 801** Servo-driven, electronically controlled shot-size and flow rate with pre-set shot selection. **See-Flo 202** Air-Over-Oil driven, manually set flow rate control with manually adjusted shot size. **See-Flo 391** Pneumatic-driven, manually set flow rate control with manually adjusted shot size.



Mix-Dispense Valve position when placing adhesive in hosel

OPERATION – Pre-set shot sizes are in the range of 0.3 cc to 1.5cc and are selected several times a day. The operator selects one of the pre-set shot sizes matched to the clubs being assembled. On command, the **Servo-Flo 801** system dispenses a precise volume of mixed material into the hosel. The shaft is then inserted, the assembly is fixtured and then pressed together for proper adhesive coverage. To test the club shaft to club head bond strength, the shaft and club head undergoes a pull test to insure that it can withstand a 5,500 P.S.I. pull-apart test.

For More Information on this Application and Product solutions visit www.SealantEquipment.com/golf

Servo-Flo[®] 801 Meter Mix Dispense System



Servo-Flo 801 Meter Assembly
with 2200-545-037 Mix Dispense Valve
and Miniature Twist-Lock Disposable Mixer

Servo-Flo 801 Technical Information

- Volume range: 0.2 cc to 7.2 cc (at 1:1)
- Fixed Ratios: 1:1 to 10:1 and beyond
- Positive displacement rod metering
- Servo-motor drive for precision flow rates, fast-change volume selection and precise shot volume control
- Body Dimensions: 3.75" x 5" x 32.1" high
- Material Fluid Ports: 1/4" NPT (4)
- Pressure Transducer Ports: (2)
- Includes protective guards

The **Servo-Flo 801** is a member of the Micro-Meter 2 series of precision Meter Mix Dispensing Systems for dispensing very small and precise volumes of 2-component acrylics, epoxies, silicones and urethane adhesives and sealants in product assembly applications.

Servo-Flo 801 Features

- Ideal for bonding club head to shaft, doming decals and weighting club heads.
- Multiple Shot Volume pre-sets for fast and accurate volume selections.
- Precise and repeatable shots, drops or beads of 2-component materials such as Acrylics, Epoxies, Silicones and Urethanes.
- Allen Bradley Panel View programmable operator interface for easy understanding and operator use.
- Easily integrated into manual, semi-automatic or fully-automated production.
- Fixed Ratio, Positive Rod Displacement metering is the finest metering principle for dependable and on-ratio metering, mixing and dispensing.
- Meter may be frame or bracket mounted. Mix Dispense Valve may be fixed, moveable or manually operated.
- Air powered flow control valves with carbide ball and seat are designed for long life.
- Material supply options: Pressure Tanks; Cartridges; 5-gallon or 55-gallon Supply Pumps.



2200-545 Mix
Dispense Valve



Servo-Flo 801 Meter and Panel Assembly
are fence mounted using a remote mounted
2200-545 Mix Dispense Valve (not shown)



Manufacturers of Precision Dispense Systems & Valves

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