

Snap-In Holder for Absolute Pressure Silicon Strain Gage Sensors



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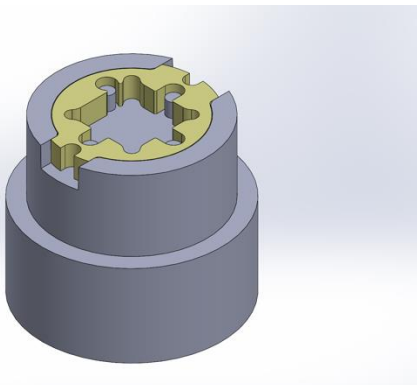
Brodan Richter

PROJECT BACKGROUND & DESIGN GOAL:

Emerson currently attaches their volume inserts into the header body using room-temperature vulcanizing silicon. This silicon limits the maximum operating temperature of their pressure transmitters and poses manufacturing challenges. **To remedy this, Emerson needs a volume insert design and prototype that can be retained inside the header body without room-temperature vulcanizing silicon.**

DESIGN OUTCOMES:

The team designed a volume insert with tabs to self-retain inside the header body. Ultem 2410r, a composite polymer was selected. The design can be easily injection molded at large volumes. ANSYS simulation determined peak stresses during insertion and thermal



cycling. These results were correlated with physical tests. The prototype is ready for more rigorous testing prior to product roll-out.

CAD assembly of the proposed volume insert (yellow) and header body.

DESIGN CONSTRAINTS:

- **SIZE:** Shall fit into existing HB packaging
- **TEMP:** GP sensors capable of reaching 200°C
- **COMPATIBILITY:** Compatible with silicon and inert oil
- **PERFORMANCE:** Shall not interfere with measurements
- **ERGONOMICS:** Ergonomic installation methodology
- **ELECTRICAL ISOLATION:** Maintain electrical isolation with HB
- **COST:** Less than \$0.75/unit at 75,000/year