

Sample Metal Bellows Seal Application: Fuel Pump

- Background

- ▶ Pump for a commercial aircraft had an existing carbon face seal experiencing high leakage and seal failures

- Operating Conditions

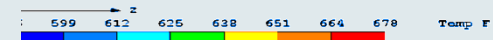
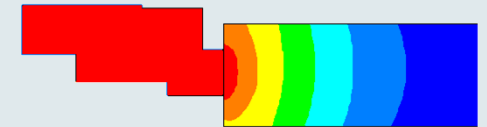
- ▶ High speed (27,000 rpm)
- ▶ Dry running (no lubrication)
- ▶ 12.5 psid

- Determining Cause and Failure Modes

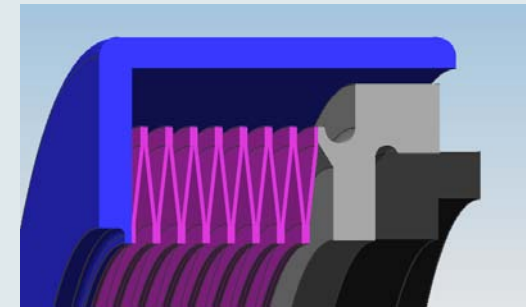
- ▶ Seal testing and QT FEA model indicated temperatures up to 650°F
- ▶ Current secondary seal taking a set due to high temperature
- ▶ Possible carbon resin exudation due to high temperature

- QT Solution

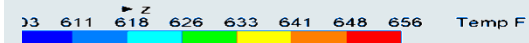
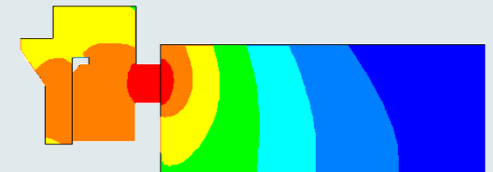
- ▶ Designed a metal bellows seal assembly with a high temperature carbon grade
- ▶ Sealed application and satisfied extreme temperature requirements



Current Seal FEA Isotherms



Welded Metal Bellows



Bellows Seal FEA Isotherms