

# Evacuation Slide Test Update

Presented to: International Aircraft Materials Fire Test Forum

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Federal Aviation  
Administration



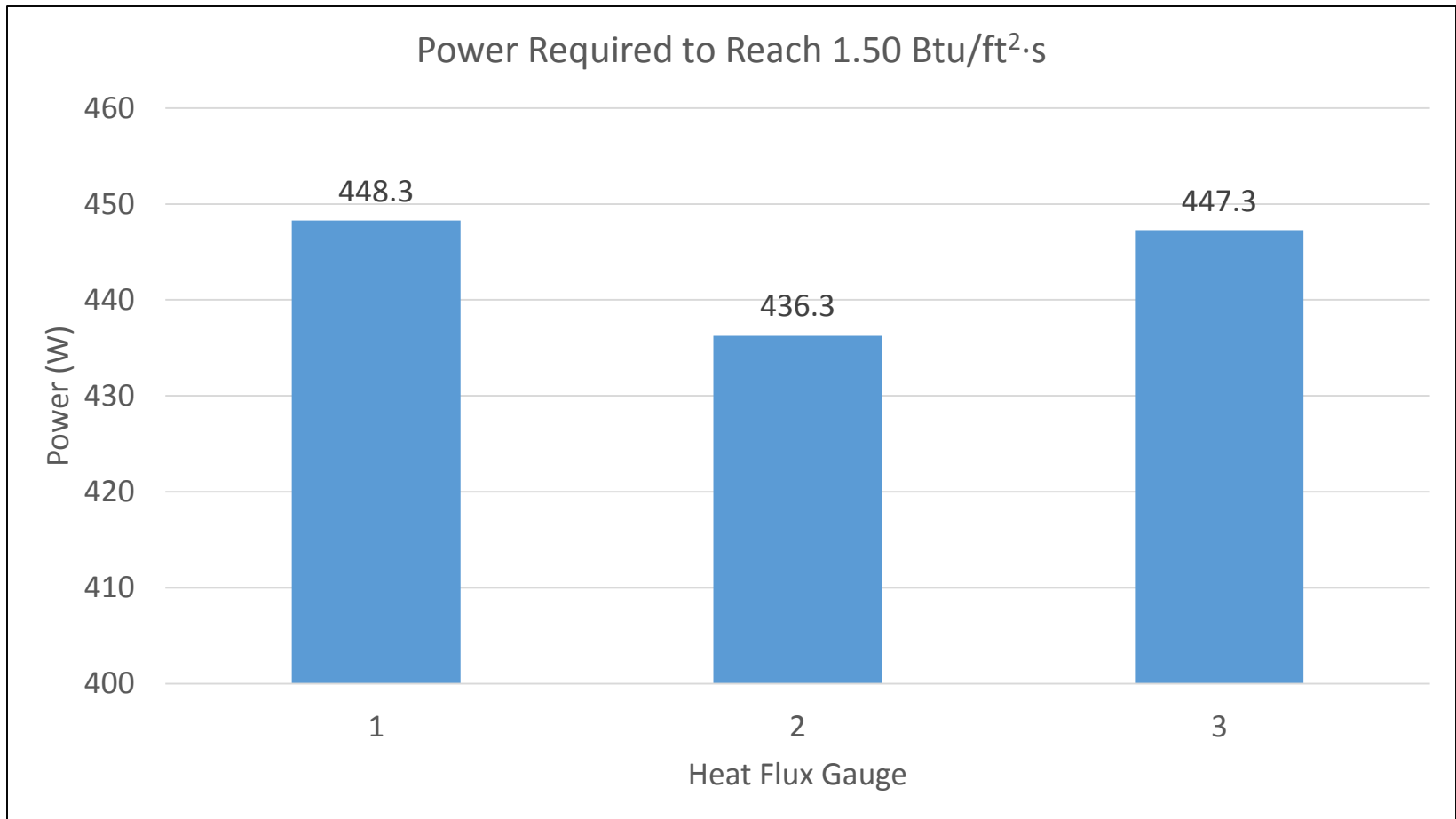
# Introduction

- **Previously testing was completed to determine if the calibration method can be changed from measuring the heat flux at the sample surface to measuring the input power going to the heater**
- **More recently tested this method with larger number of heaters and heat flux gauges to determine if measuring the power will truly increase repeatability.**



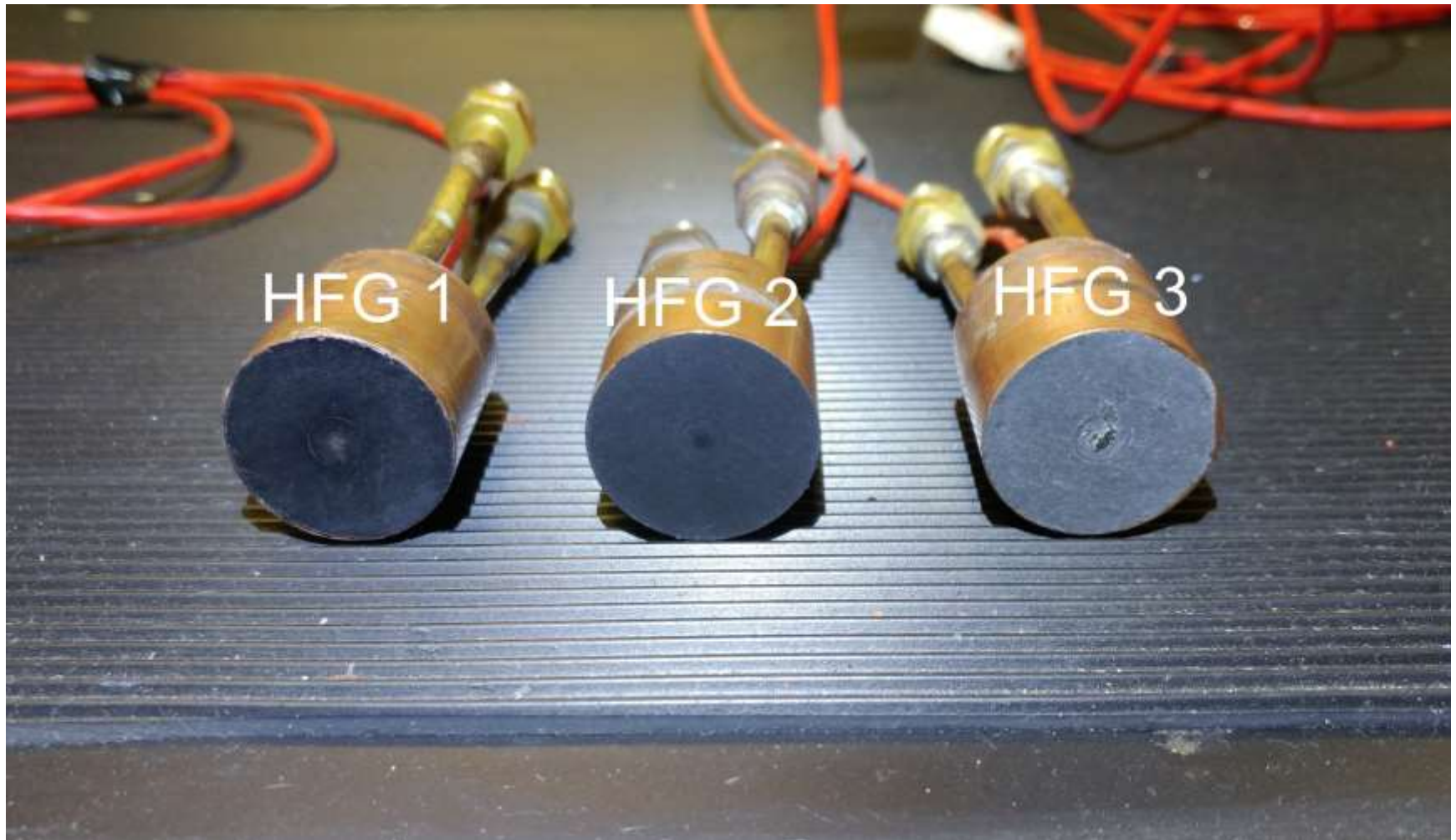
# Heat Flux Gauge Comparison

- Heat Flux Gauges calibrated before testing, but not repainted



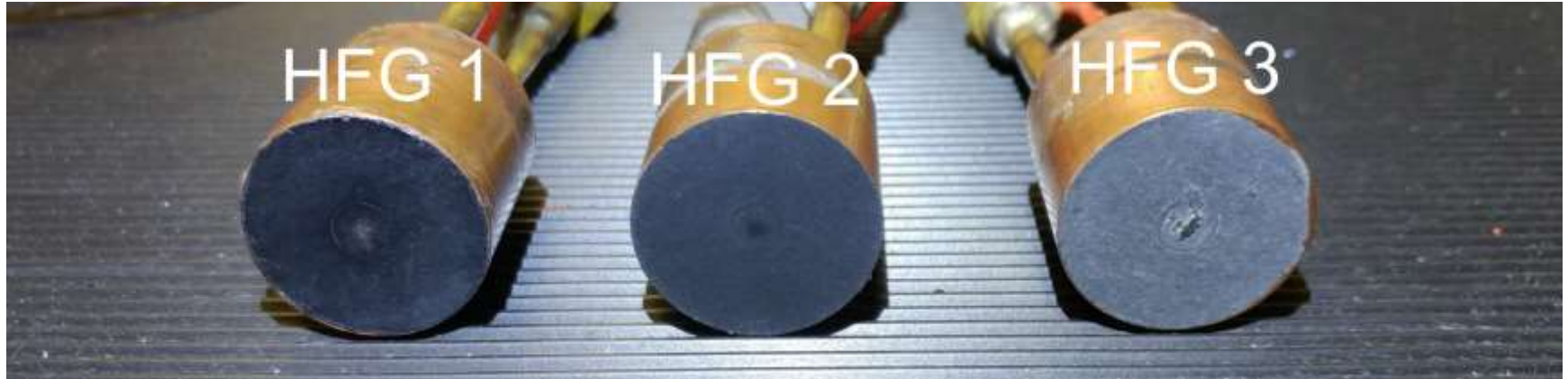
*Solid Coil Heater #1*

# Heat Flux Gauge Comparison



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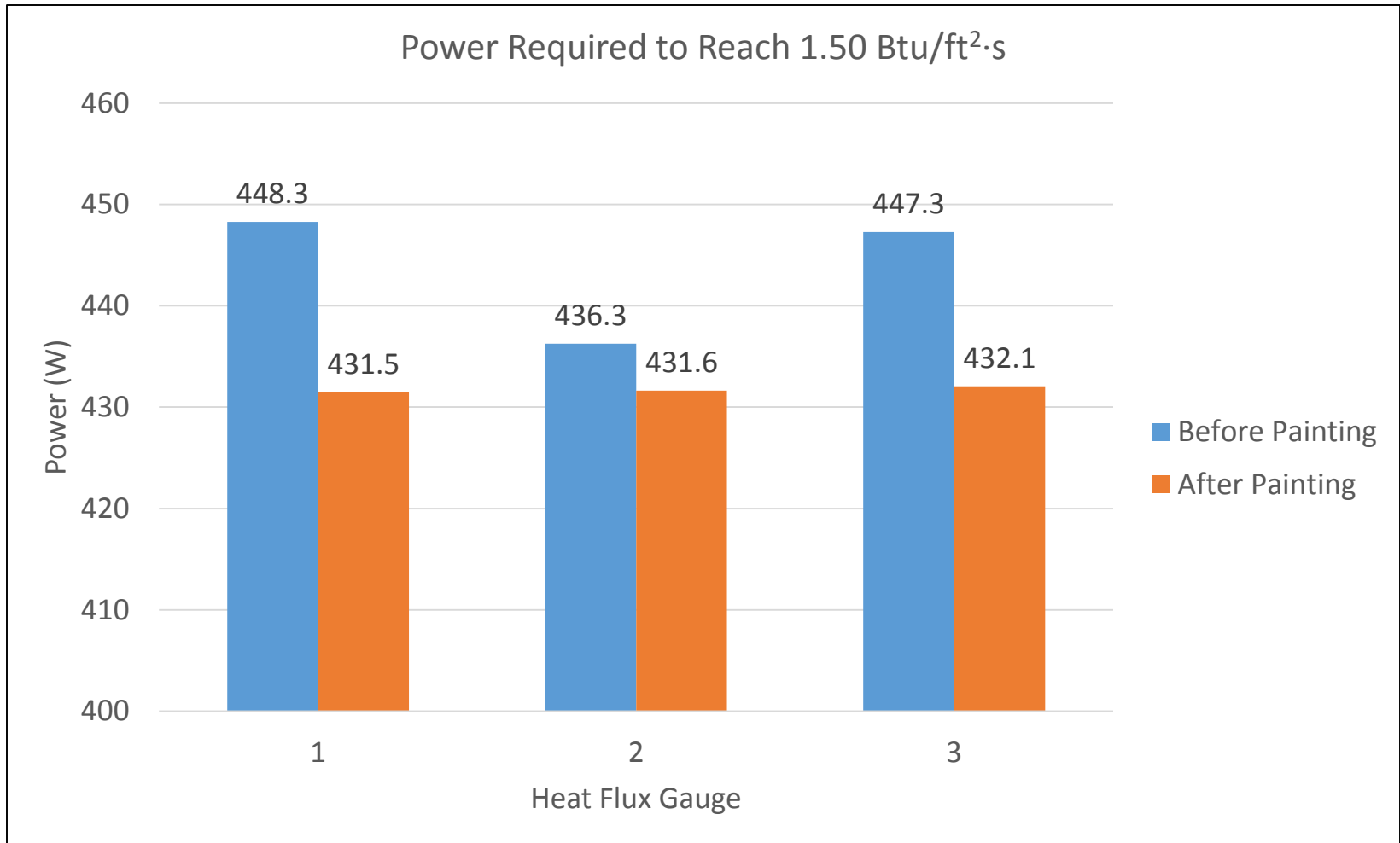
Before Painting:



After Painting:



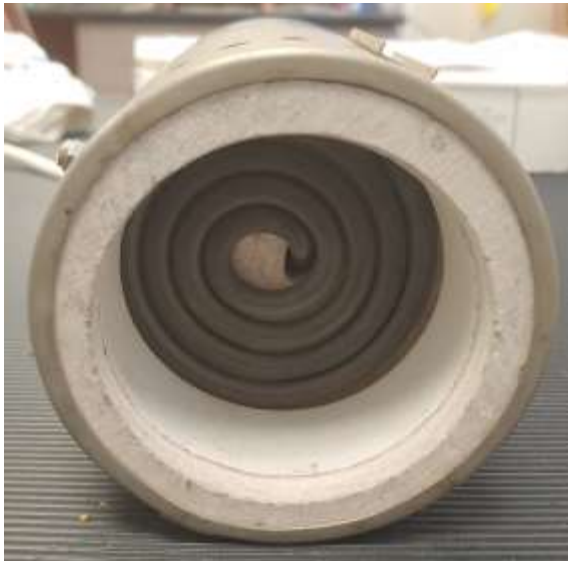
# Heat Flux Gauge Comparison



*Solid Coil Heater #1*

# Heater and HFG Comparison

- **Tested 6 heaters and 3 heat flux gauges**
  - 4 solid coil, 2 wire coil

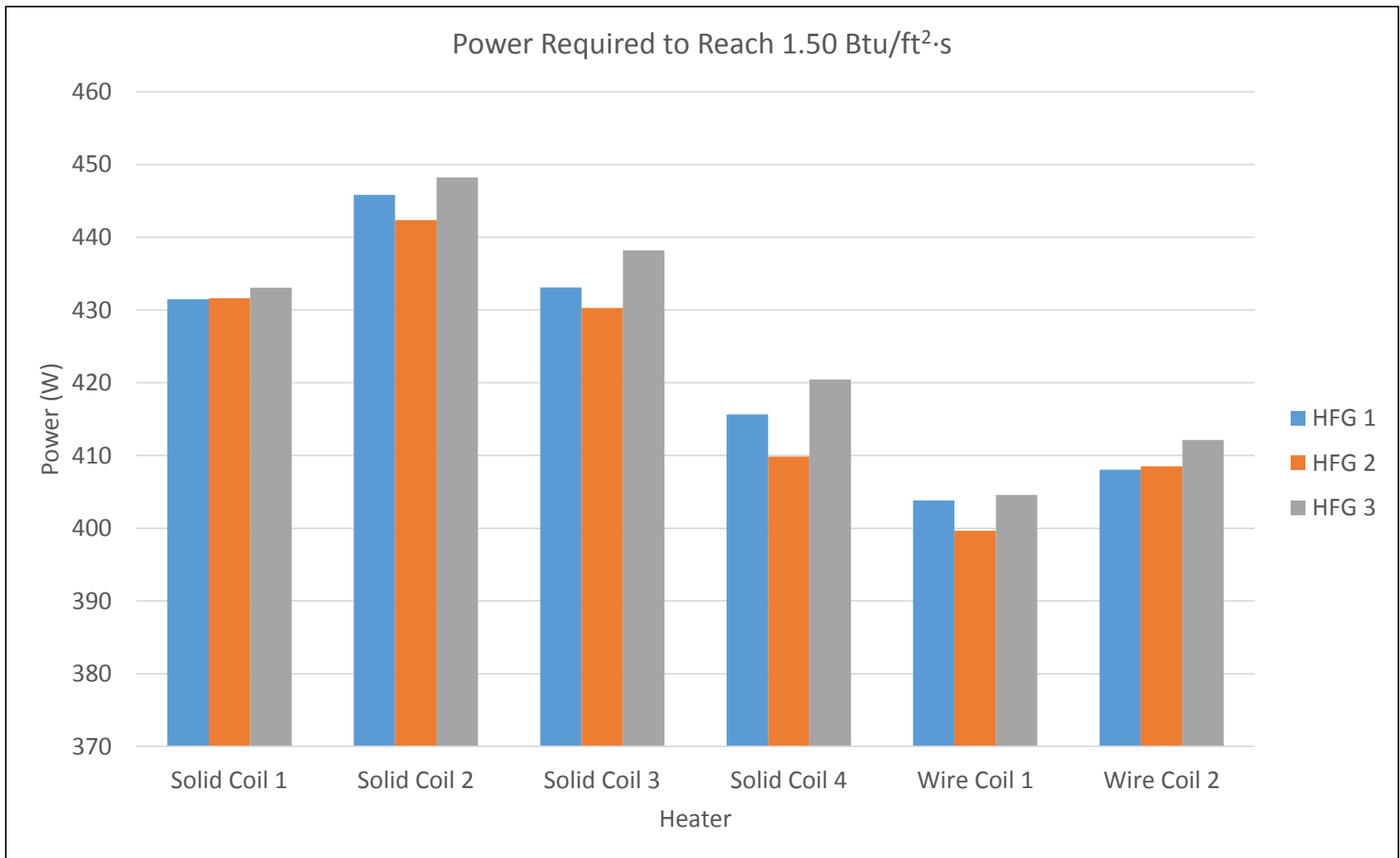


Solid Coil



Wire Coil

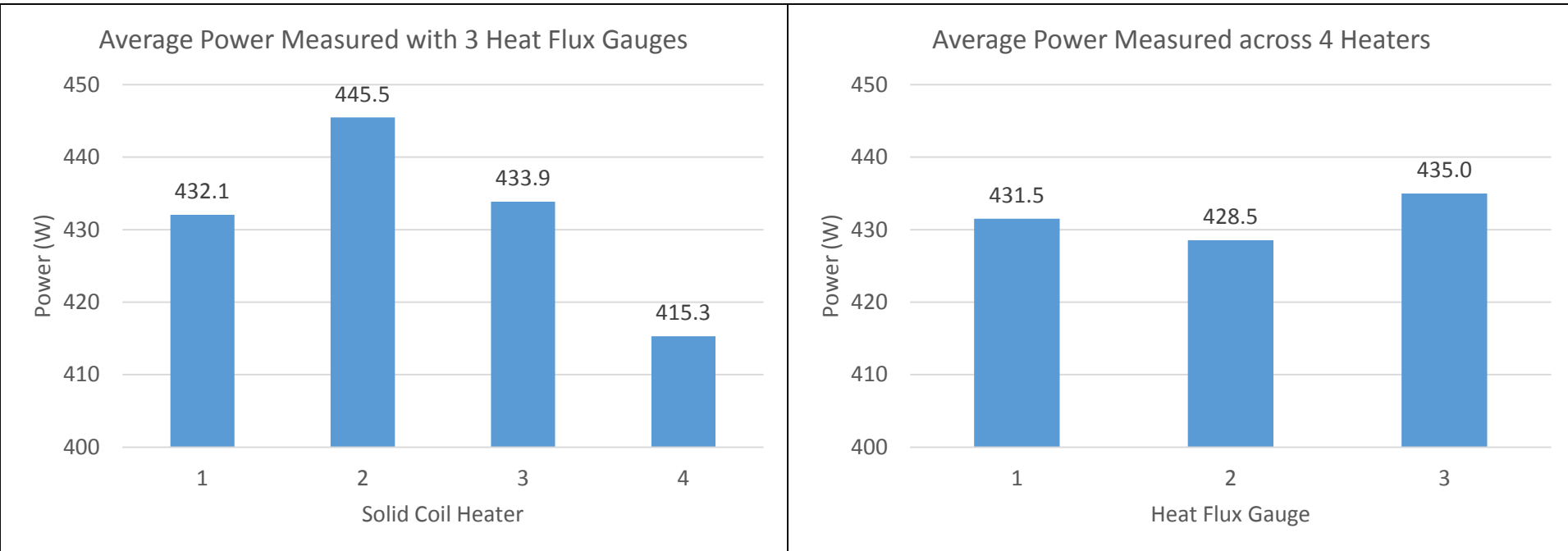
# Heater and HFG Comparison





# Heater and HFG Comparison

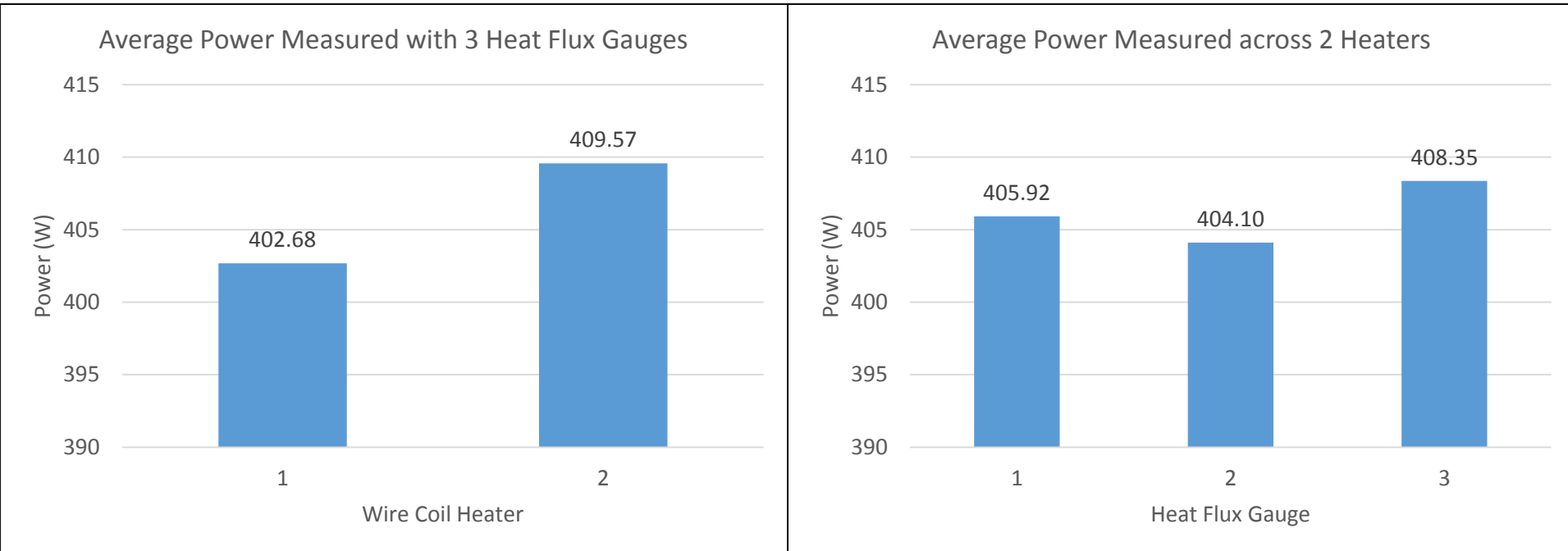
Comparing range of power required for different heaters vs different heat flux gauges to reach 1.50 Btu/ft<sup>2</sup>·s (Solid Coil Heaters only)



- Different heaters varied from 415 W to 445 W
- Different heat flux gauges varied from 429 W to 435 W

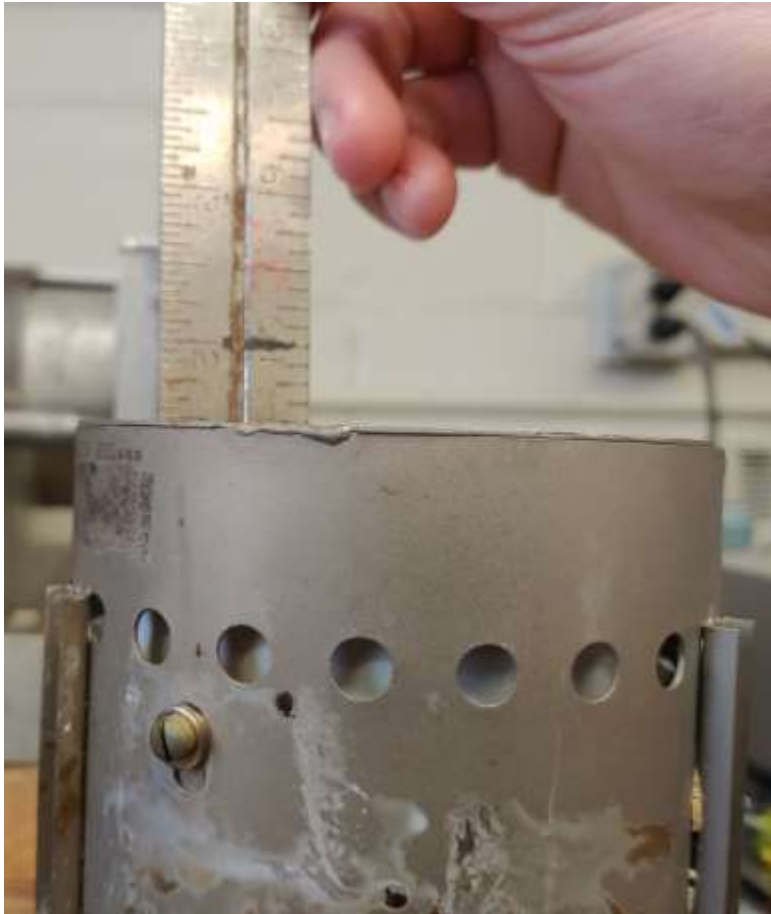
# Heater and HFG Comparison

## Wire Coil Heater Comparison



- Different heaters varied from 403 W to 410 W
- Different heat flux gauges varied from 404 W to 408 W

# Why are the Heaters so Different?

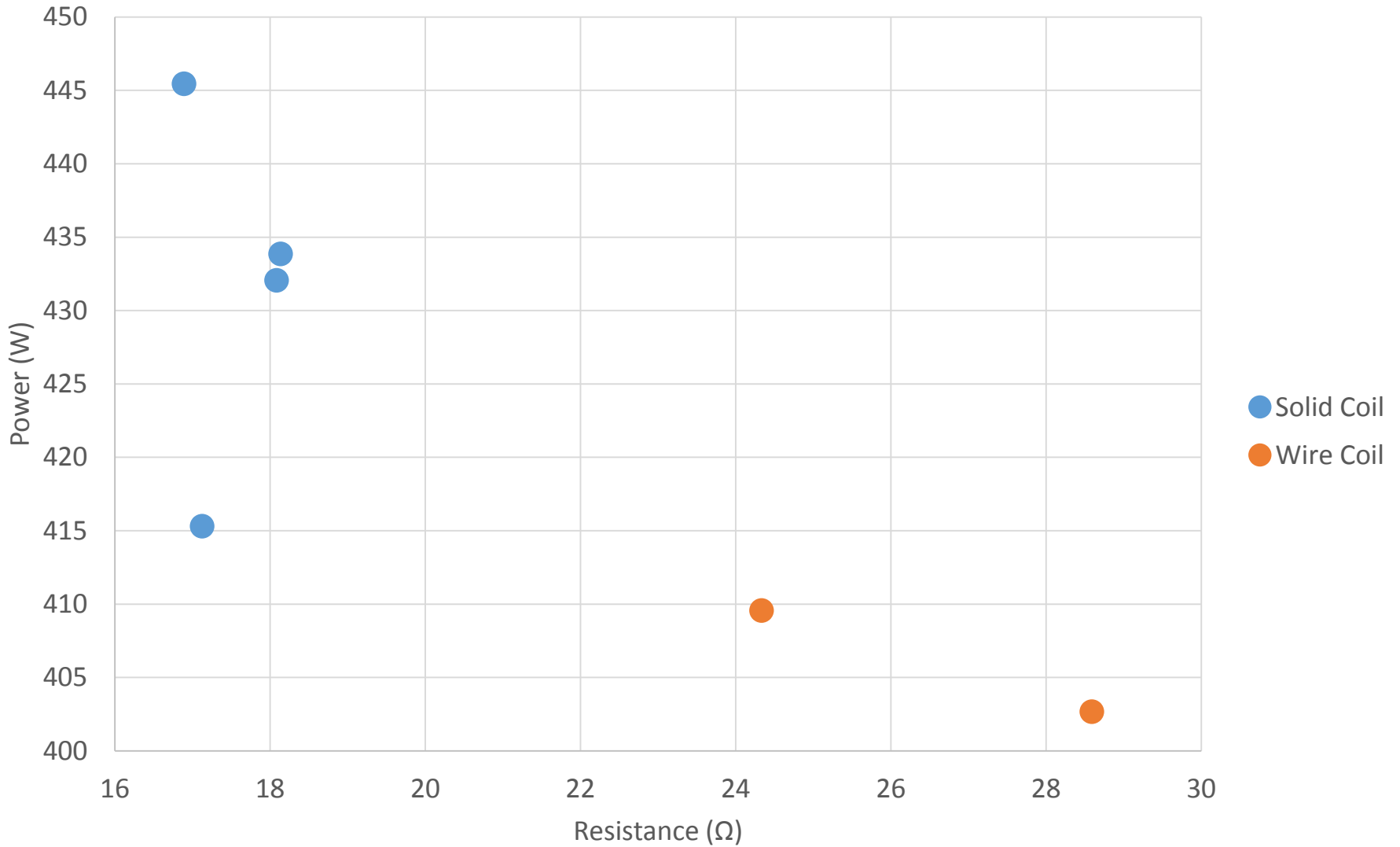


Set coil to 1.5 inch depth



- Coils aren't all on exactly the same plane (Heater 2 varies 3/16")
- Condition of surface could affect emissivity

# Heater Internal Resistance vs. Power Required for Calibration



# Conclusion

- **Much more repeatable calibrations changing heat flux gauges vs changing heaters**
- **Measuring heat flux produces more accurate calibration than measuring power**
- **Make sure heat flux gauge surface is in good condition and calibration is up to date**



# Questions?

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