

VFP Update March 2019

Presented to: **IAMFTF Savannah, GA**

By: **Tina Emami and Rick Whedbee**

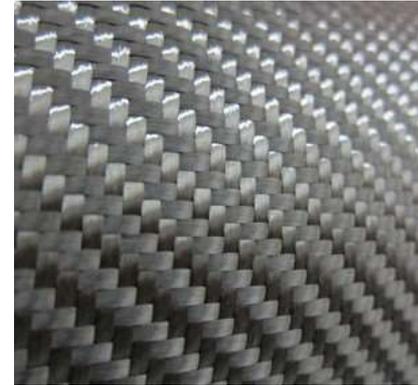
Date: **March 5-6, 2019**



**Federal Aviation
Administration**

Background

- Planned method to test composite structure components and other non-metallic, extensively used parts in inaccessible areas.
 - Composite Fuselage
 - Wires
 - Ducting
 - Sleevings



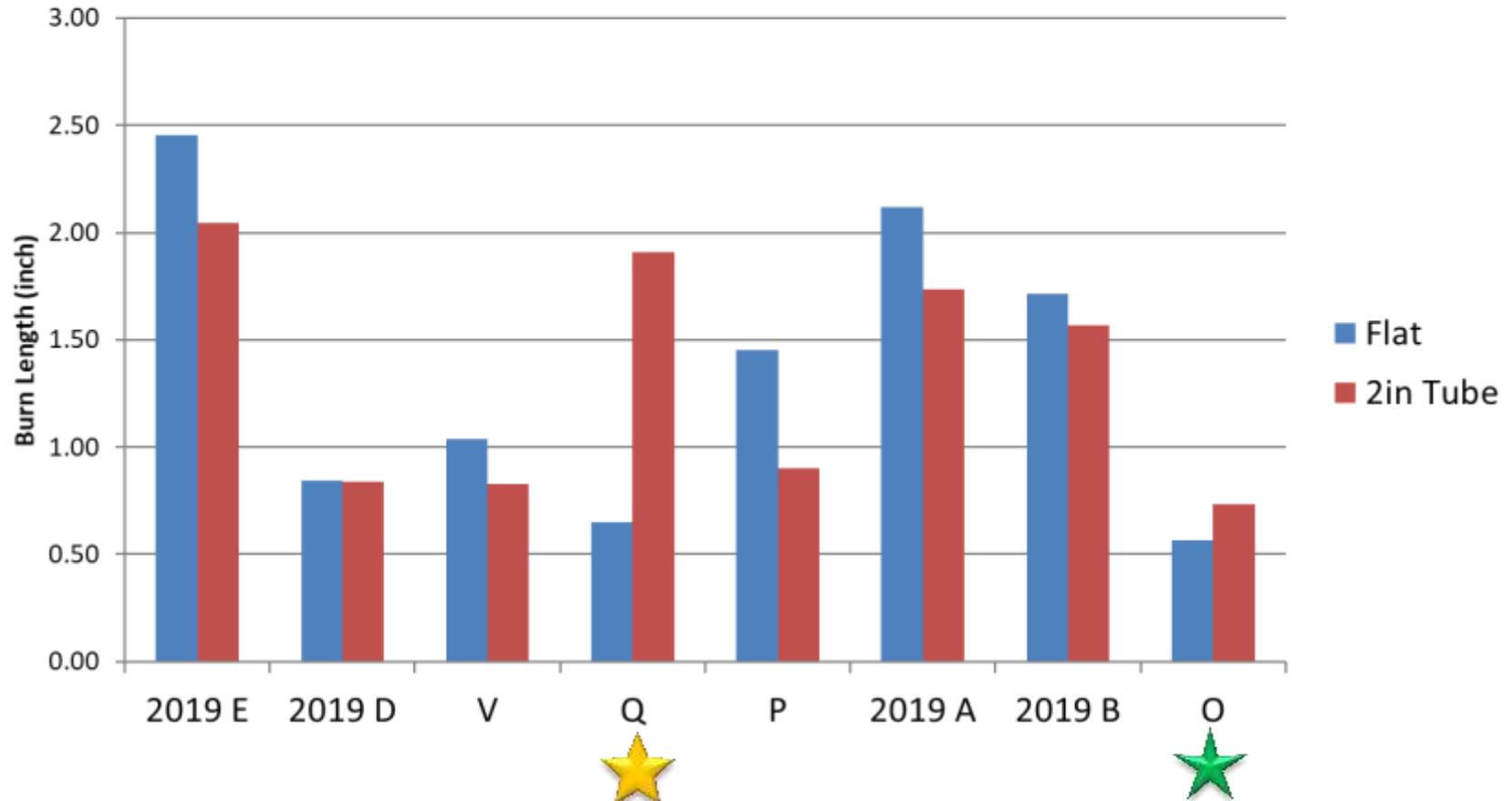
Flat vs Round Duct Testing in VFP

- **3 samples were tested per material per shape**
- **Round Duct materials were 2 inches in diameter**
 - Material Q had a 2 inch by 2 inch square cross section ★
- **Data from materials V, Q, P, and O is compared to Reinhardt's Development of an Improved Fire Test Method for Aircraft Ducting Materials**

Flat vs Round Duct Testing in VFP

Materials V, Q, P, and O correspond to John Reinhardt's "Development of an Improved Fire Test Method for Aircraft Ducting Materials", 2008. All tests were conducted using VFP 3 heater assembly.

Flat vs Round Duct



Square Construction

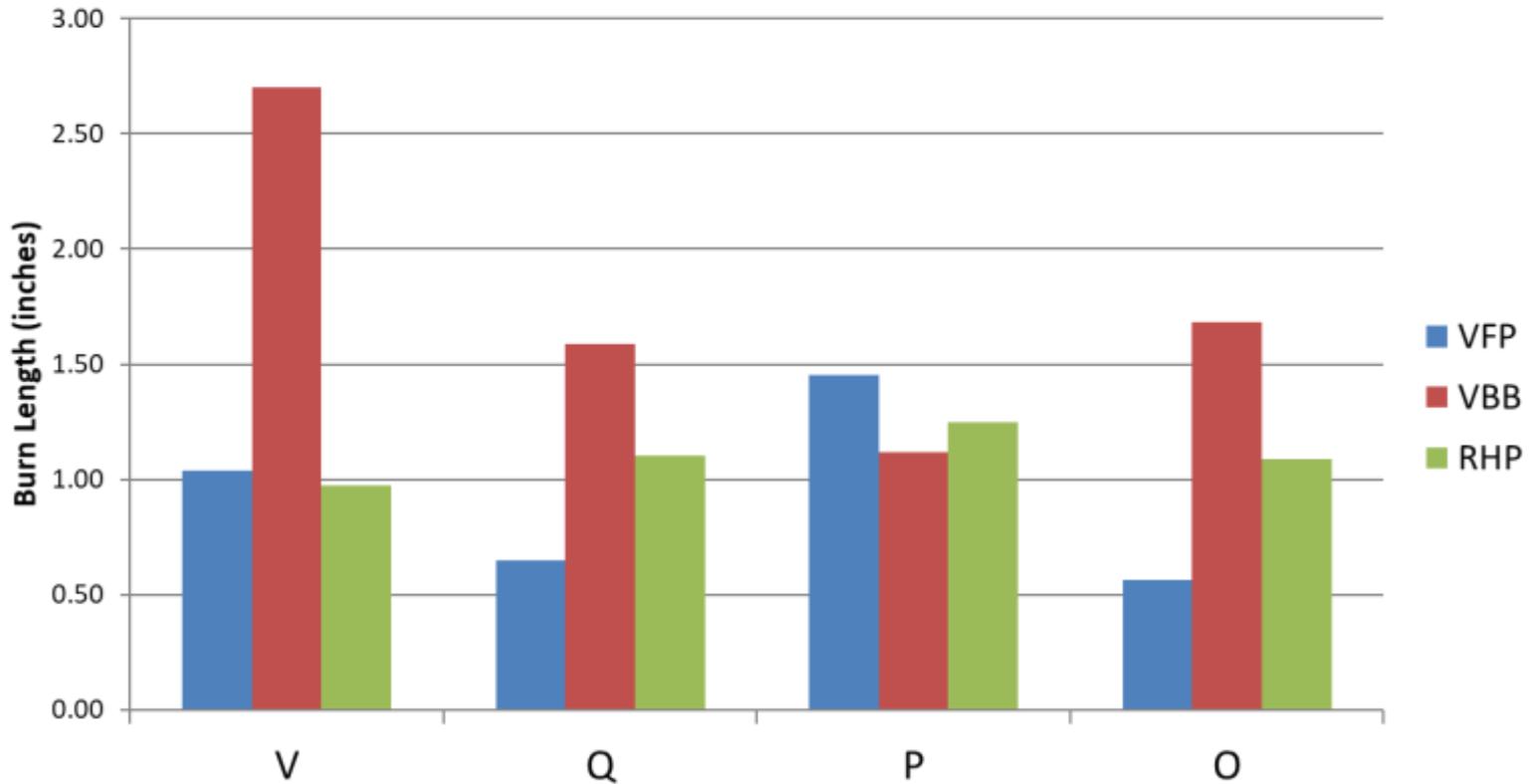


Federal Aviation
Administration

Comparing VFP to the 12-Sec VBB and RHP (Reinhardt Data)

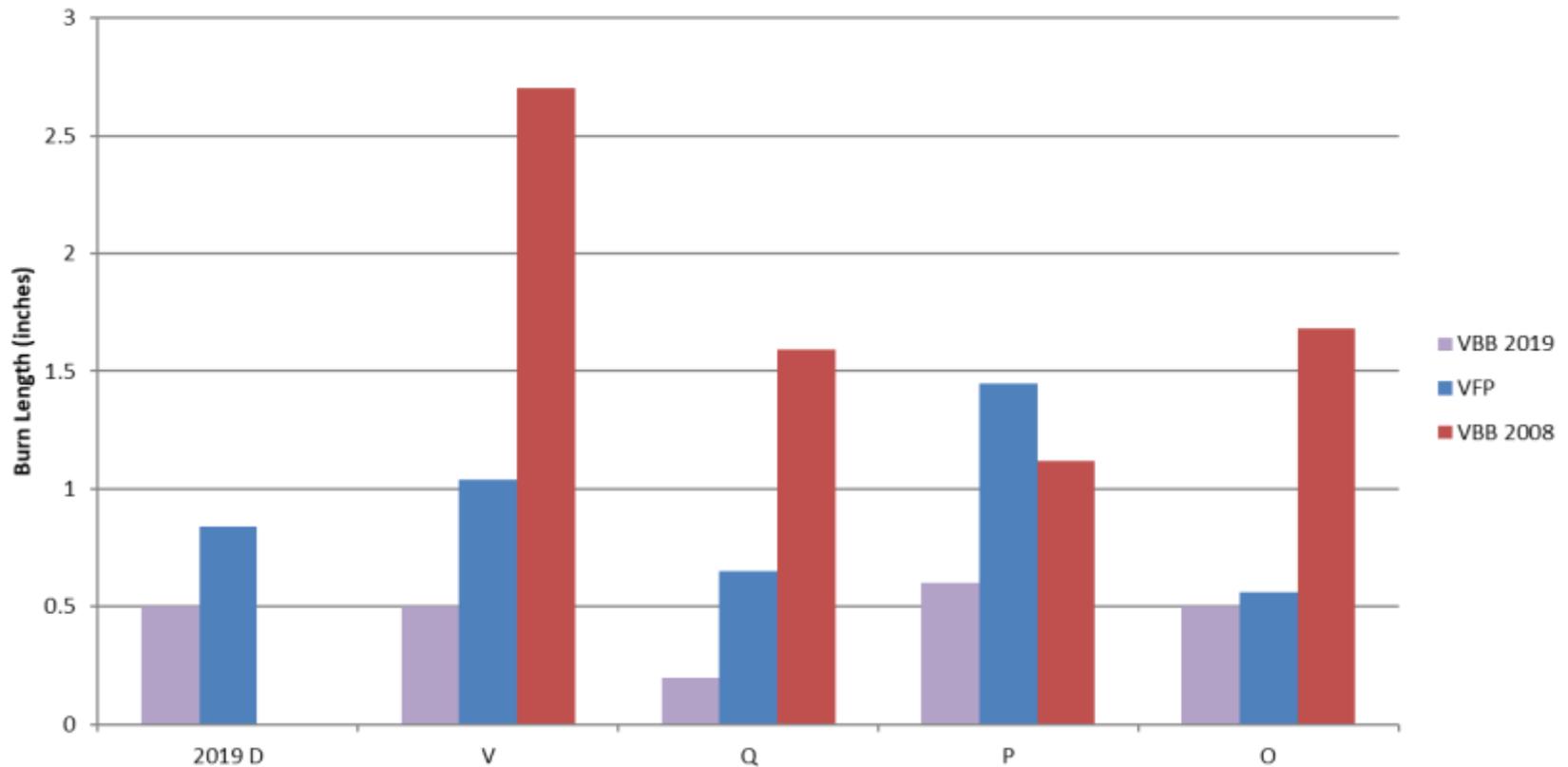
Materials V, Q, P, and O correspond to John Reinhardt's "Development of an Improved Fire Test Method for Aircraft Ducting Materials", 2008

Comparing Ducting Material in 3 Tests: VFP vs Reinhardt

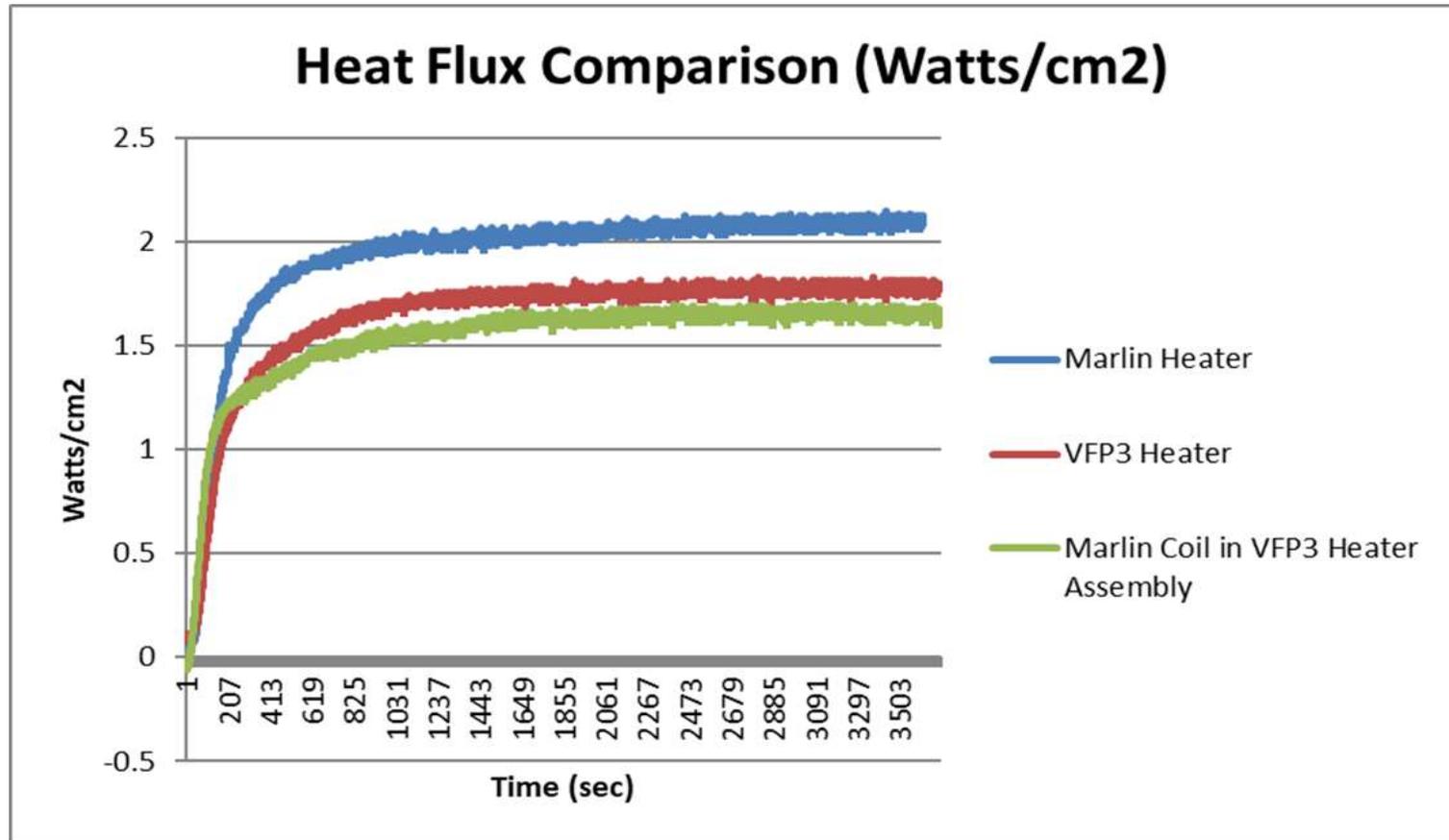


Comparing the VFP test with the VBB test (2008 Data vs 2019 Data)

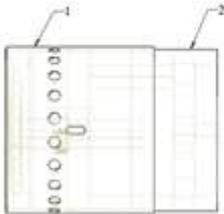
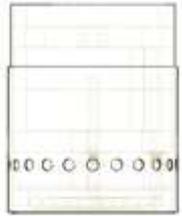
VFP vs VBB 12-Sec. Test (2008 vs 2019)



Marlins Coil in VFP 3 Housing Heat Flux Comparison

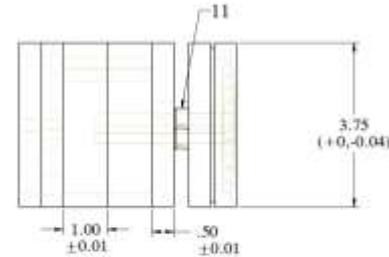


Heater Assembly Technical Drawings



KEY, Page 1

- Detailed dim's and materials
- Specified coil



KEY, Page 2



Heater vs No Heater Testing

•Heater Off, **Cold** Chamber

Burn Length (inch)	After Flame (seconds)	Chamber Temperature (°C)
0.44	3	16
0.62	6	16
0.54	4	17

•Heater On, **Hot** Chamber (Regular style testing)

Burn Length (inch)	After Flame (seconds)	Chamber Temperature (°C)
4.07	92	65
4.09	88	69
4.45	79	72

•Heater Off and taken out of chamber, **Hot** Chamber

Burn Length (inch)	After Flame (seconds)	Chamber Temperature (°C)
0.52	10	61
0.81	21	57
0.52	4	54

Thermoplastic Tests

Sample 2

	Burn Length (inch)	After Flame (sec)	% Weight Loss	Thickness
Test 1	2.13	2	1.56	0.050" +/- 0.050" +/-
Test 2	2.74	0	1.54	0.050" +/-
Test 3	2.82	0	0.00	0.050" +/-
Test 4	2.79	0	2.13	0.050" +/-
Test 5	2.67	0	1.75	
average	2.63	0.40	1.40	
stdev	0.29	0.89	0.82	
%stdev	10.84	223.61	58.40	

Sample 3

	Burn Length (inch)	After Flame (sec)	% Weight Loss	Thickness
Test 1	2.12	2	1.30	0.050" +/-
Test 2	2.14	1	1.35	0.050" +/-
Test 3	1.93	3	5.75	0.050" +/-
Test 4	1.92	4	1.25	0.050" +/-
Test 5	1.84	23	4.00	0.050" +/-
average	1.99	6.60	2.73	
stdev	0.13	9.24	2.05	
%stdev	6.67	139.94	75.21	



Task Group Topics

- **Further radiant heater discussions**
- **Testing of Thermoplastics**
- **Round Robin?**
- **Open Forum**



NEW! CONCEPT EQUIPMENT VFP



Federal Aviation
Administration