

# Aircraft Wiring

**Pat Cahill**

**Engineer, Fire Safety Team**

**FAA Wm. J. Hughes Technical Center**

**Atlantic City International Airport, NJ 08405**

**International Aircraft Materials Fire Test Working Group**

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Administration**



# Aircraft Wiring

- Round Robin
  - Results of the first Round Robin were given out to the participants that attended the Georgia meeting. We did not discuss the data due to few participants there.
  - Four outside labs participated in this Round Robin.
  - Samples tested:
    - One ½ inch (12.7 mm) bundle –Hybrid construction 20 AWG
    - One bundle (4 cables of 2 twisted pair) ~1/2 inch (12.7mm)
    - One blue single cable (multi conductors)
    - One black single wire cable
    - One single four inch (101.6mm) long piece of wire (some labs used alligator clips and additional wire to extend the sample length)
    - One multi-conductor cable (4-pair)

# Aircraft Wiring

- Round Robin Results:

Wire A				
Lab	Sample	After Flame (sec.)	Burn Length (in.)	Burn Length (mm)
1	1	0	0.66	17.00
1	2	0	0.47	12.00
1	3	0	0.66	17.00
2	1	0	1.20	30.40
2	2	0	1.10	27.90
2	3	0	1.10	27.90
3	1	0	0.59	14.90
3	2	0	0.51	12.90
3	3	0	0.39	9.90
4	1	0	0.70	17.70
4	2	0	0.70	17.70
4	3	0	0.86	21.80

Wire B				
Lab	Sample	After Flame (sec.)	Burn Length (in.)	Burn Length (mm)
1	1	3.44	7.40	190.00
1	2	4.38	7.90	203.00
1	3	2.73	7.40	190.00
2	1	>90	11.00	279.40
2	2	>90	11.00	279.40
2	3	>90	11.00	279.40
3	1	>30		
3	2	>30		
3	3	>30		
4	1	>30		
4	2	>30		
4	3	>30		

# Aircraft Wiring

- Round Robin Results:

<b>Wire C</b>				
Lab	Sample	After Flame (sec.)	Burn Length (in.)	Burn Length (mm)
1	1	0	0.66	17.00
1	2	0	0.98	25.00
1	3	0	0.90	23.00
2	1	0	1.10	27.90
2	2	0	1.00	25.40
2	3	0	1.00	25.40
3	1	0	0.78	19.80
3	2	0	0.98	24.80
3	3	0	0.94	23.80
4	1	0	0.78	19.80
4	2	0	0.78	19.80
4	3	0	0.59	14.90

<b>Wire D</b>				
Lab	Sample	After Flame (sec.)	Burn Length (in.)	Burn Length (mm)
1	1	31	8.50	216.00
1	2	31	7.90	203.00
1	3	31	7.90	203.00
2	1	>90	11.00	279.40
2	2	>90	11.00	279.40
2	3	>90	11.00	279.40
3	1	>30		
3	2	>30		
3	3	9	0.66	16.70
4	1	>30		
4	2	>30		
4	3	9	0.66	16.70

# Aircraft Wiring

- Round Robin Results:

<b>Wire E</b>				
<b>Lab</b>	<b>Sample</b>	<b>After Flame (sec.)</b>	<b>Burn Length (in.)</b>	<b>Burn Length (mm)</b>
1	1	1.07	0.70	18.00
1	2	0.97	0.70	18.00
1	3	1.28	0.78	20.00
2	1	0	1.10	27.90
2	2	1.5	1.10	27.90
2	3	1	1.00	25.40
3	1	0	0.66	16.70
3	2	0	0.78	19.80
3	3	0	0.78	19.80
4	1	0	0.78	19.80
4	2	0	0.55	13.90
4	3	0	0.82	20.80

<b>Wire F</b>				
<b>Lab</b>	<b>Sample</b>	<b>After Flame (sec.)</b>	<b>Burn Length (in.)</b>	<b>Burn Length (mm)</b>
1	1	31	0.70	18.00
1	2	31	0.70	18.00
1	3	31	0.70	18.00
2	1	>90	>10	279.40
2	2	>90	>10	279.40
2	3	>90	>10	279.40
3	1	>30		
3	2	>30		
3	3	>30		
4	1	>30		
4	2	>30		
4	3	>30		

# Aircraft Wiring

- Sleeves and Shrink Tubing
  - Tested three different aircraft wires with and without “sleeving”
    - Hybrid construction
    - Extruded X-linked ETFE ... pressurized applications
    - Single wire or composite cable PTFE jacket...unpressurized applications
  - Tested with PTFE sleeve: M23053/12 Class 2 TFE 2X and expandable PTFE

# Aircraft Wiring

- Sleeves and Shrink Tubing
  - Test Results:

Specimen	Width	Length	After Flame	Flame Prop.*
<b>Wire 1</b>	½ inch	16 inch	0	0.5
With Ex. Teflon	½ inch	16 inch	0	0.5
With TFE-2X	½ inch	16 inch	0	0
<b>Wire 2</b>	½ inch	16 inch	0	0.75
With Ex. Teflon	½ inch	16 inch	0	0.56
With TFE-2X	½ inch	16 inch	0	0
<b>Wire 3</b>	½ inch	16 inch	0	0.5
With Ex. Teflon	½ inch	16 inch	0	0.5
With TFE-2X	½ inch	16 inch	0	0

*\*Inches*

# Aircraft Wiring

- Round Robin
  - We are planning the second Round Robin.
  - We will include a 22 AWG bundle, sleeving and shrink tubing, and larger AWG bundles.





# Aircraft Wiring

- Work being done at the Tech Center
  - We are currently evaluating larger AWG wires in the ½ inch bundle to see if we get the same data as a 20 AWG bundle (burn length and after flame).
  - If successful, we will save wire and time in bundle preparation.
  - If we find that the smaller AWG bundle produces longer burn lengths or longer after flame times, we will stay with the smaller AWG wires.



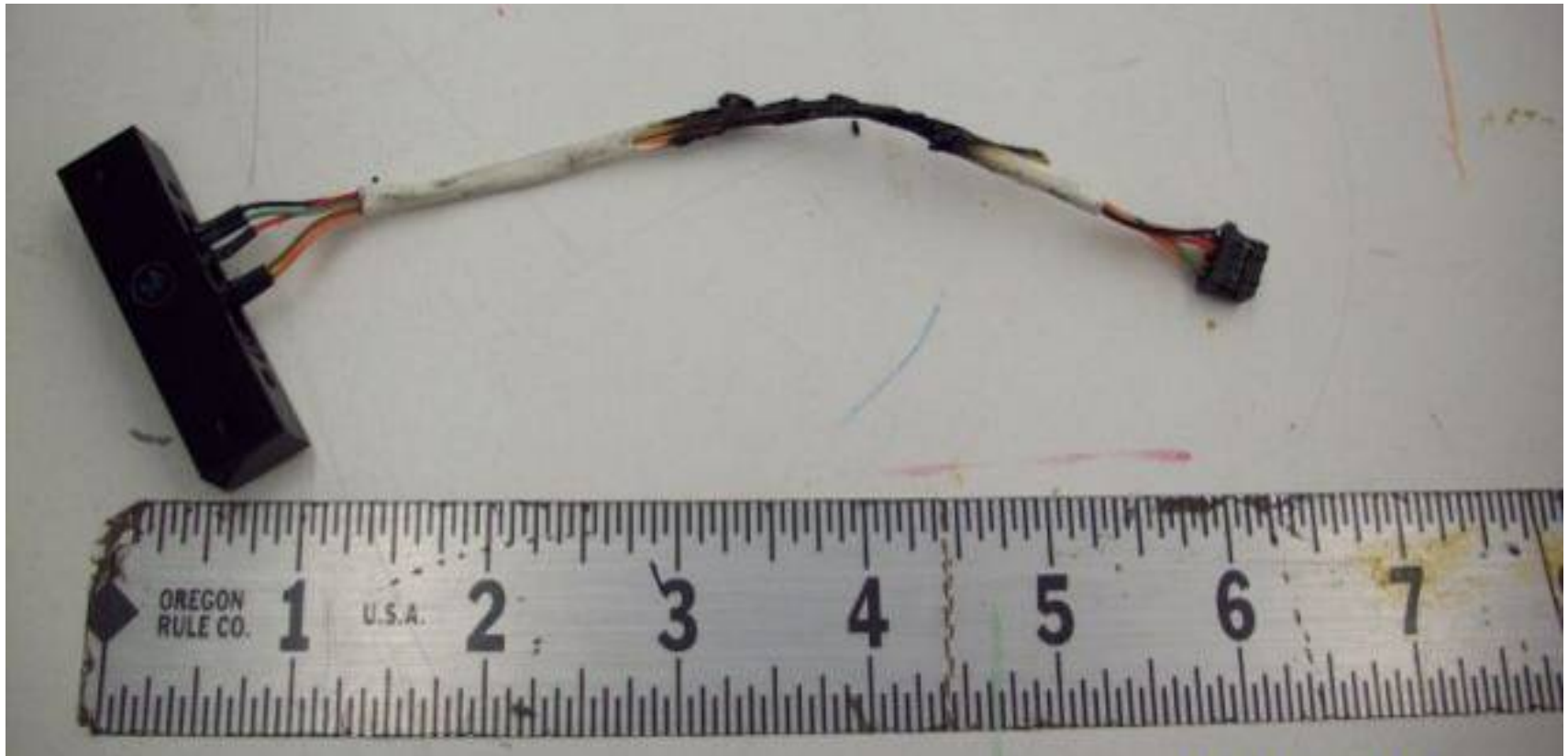
# Aircraft Wiring

- Task Group Discussion
  - One lab is working on a guide to attach to the panel in order to keep the 3-inch requirement (bundle to panel).
  - How do we handle a “real” bundle that is comprised different lengths and different wires? (Pictures to follow)
  - How long do we need to keep an obvious failing bundle in the chamber?
  - Should we make 20AWG the standard size wire for testing?



# Aircraft Wiring

- Examples of “real” bundles ...



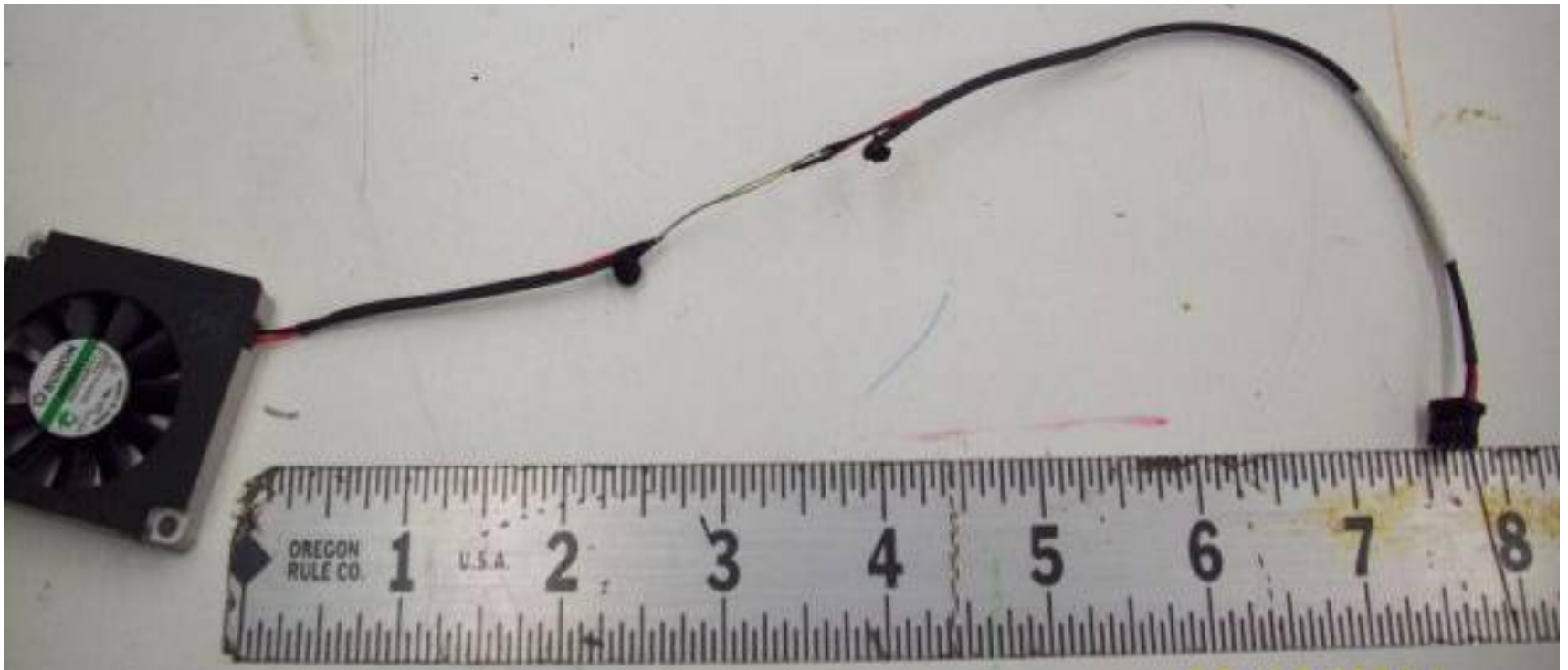
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