

OSU & HR2 Updates

2013 March Materials Meeting
Seattle, WA

Materials Working Group

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March, 2013



Federal Aviation
Administration



AGENDA

- OSU
 - Wet Test Meter Discussion
 - System Air Pressure Data
 - SOP's Development (FAA Handbook)
- HR2 Update



OSU Wet Test Meter Discussion

Preparing Meter For Use

1. Level (Bubble Exactly Centered)
2. Avoid Contaminants From Entering The Meter
3. Distilled Water Recommended
4. Slightly Over Service Meter Above Pointer Tip
5. Disconnect Inlet / Outlet Tubing
6. Drain Until Lower Meniscus Touches Needle Tip
7. Verify Tight Connections



OSU Wet Test Meter Discussion

- Passing Gas
 - New Water or Gas Bottle? – Minimum of 1 hr.
 - Routine Calibration – 10 to 15 minutes Prior To
- Disturbance/Hesitation Observed When In Use?
 - Normal occurrence @ 4 different intervals during one complete revolution of drum
 - 3x Flow Recommended For Better Average
- Correction Factor Should Be Used



OSU Wet Test Meter Discussion

- Calculating Actual Flow:

$$\text{Actual Flow} = \text{Observed Flow} / \frac{(\text{Time in Seconds})}{60}$$

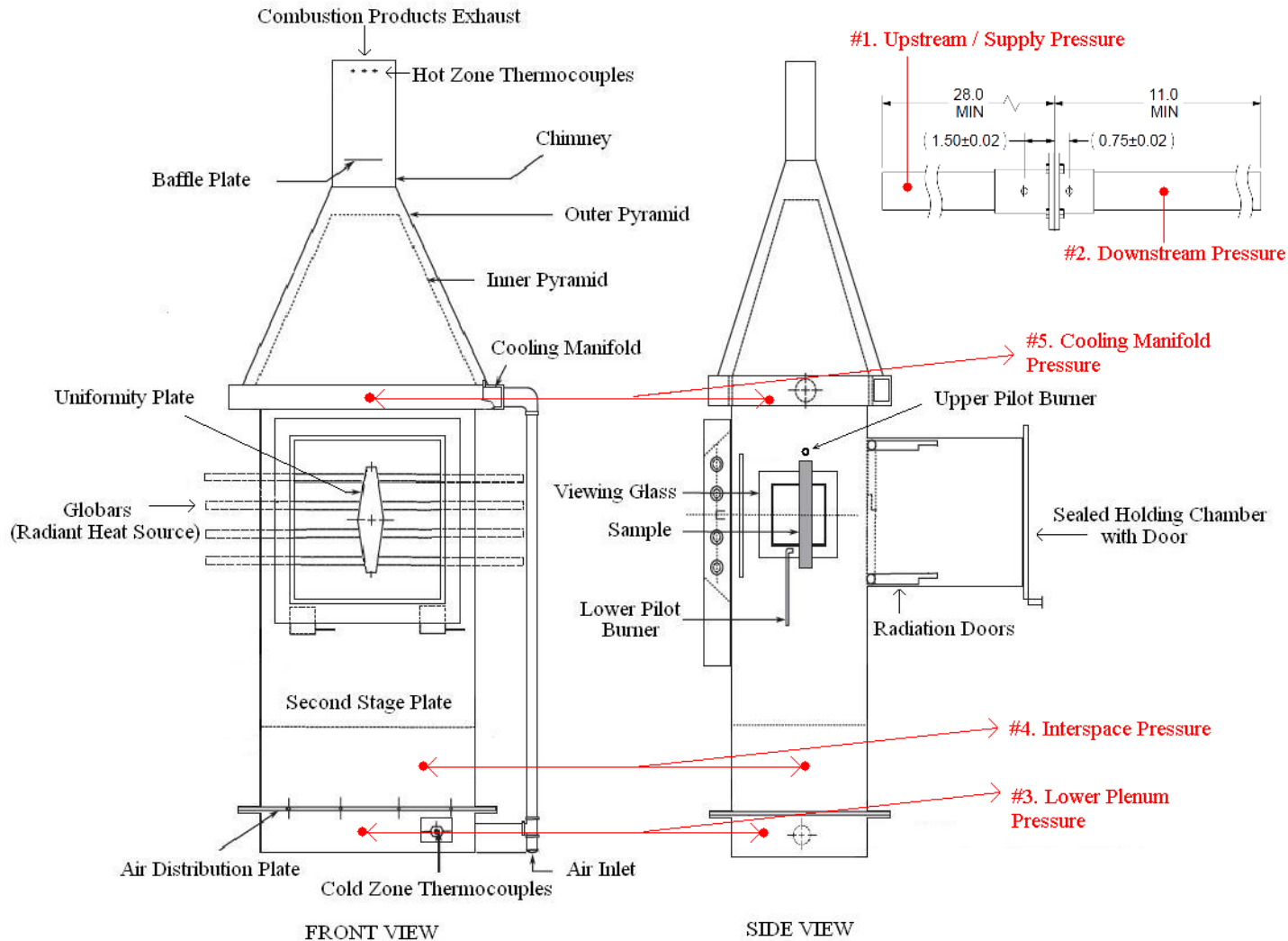
- If MFM/MFC used must be referenced to WTM
- Tubing Diameter / Length / Back Pressure
- Leak Check Often
- Water Vapor Calculation (WTM Water Temperature as T)

Antoine Constants for Water $\log_{10} p = A - \frac{B}{C + T}$.

Where:

	A	B	C
Water	8.07131	1730.63	233.426

OSU Air System Pressure Data

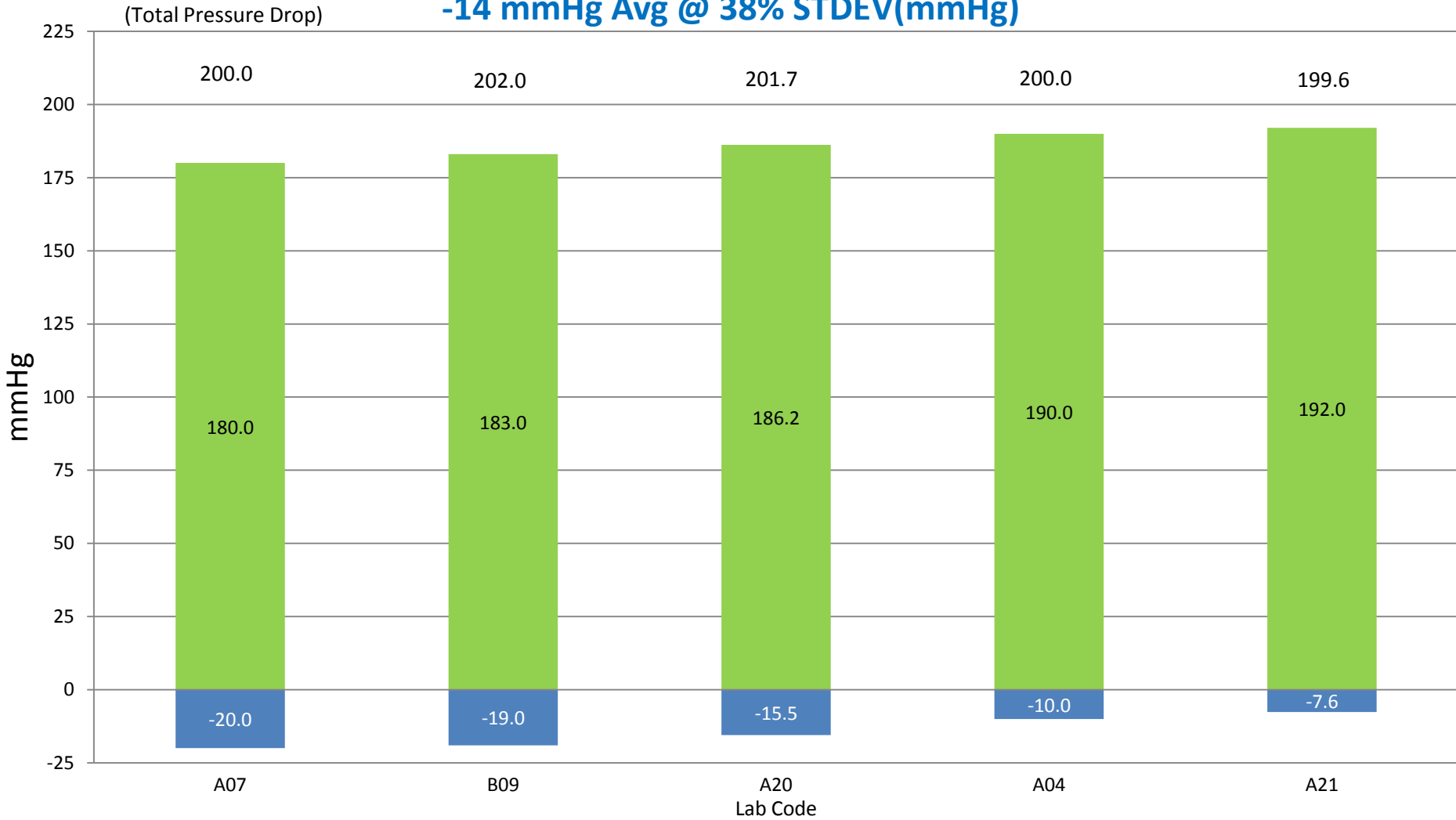


Upstream Positive Pressure [Downstream port plugged]

186 mmHg Avg @ 3% STDEV

Downstream Negative Pressure [Upstream port plugged]

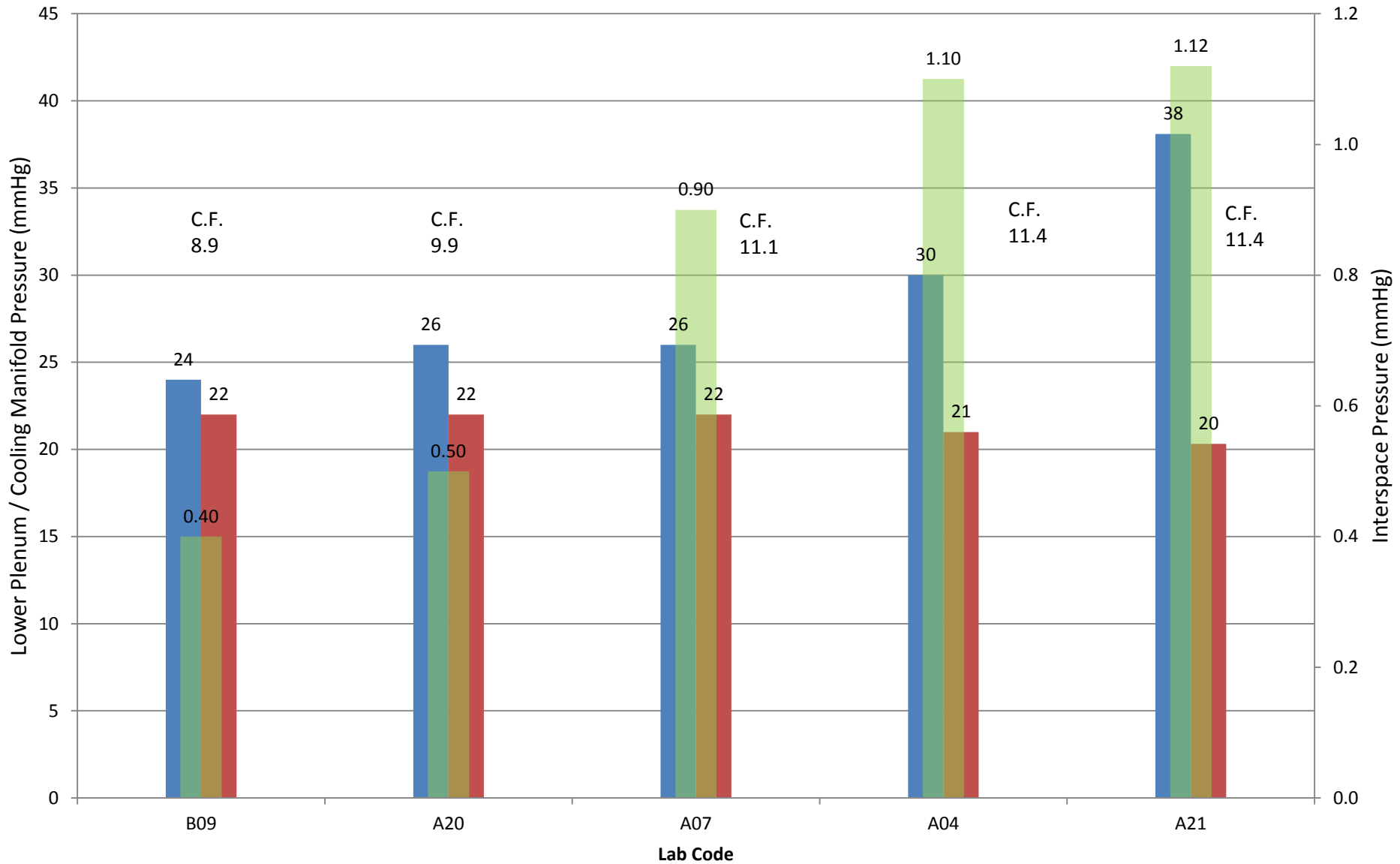
-14 mmHg Avg @ 38% STDEV(mmHg)



■ Lower Plenum Pressure (mmHg)

■ Cooling Manifold Pressure (mmHg)

■ Interspace Pressure (mmHg)



Factors That May Influence System Pressures

Piping

- Distance Between Orifice Plate and Unit
- Number of Bends

Orifice Plate

- Residue Buildup on Opening / Incorrect Diameter
- 3/4” Hole With Rounded Edges (Should Have Square Profile)
- Leaks: Flange / Plate / Fittings / Pressure Tubing / Manometer
- Pressure Sensing Points Not Accurately Positioned
- Length / I.D. of Tubing From Orifice meter to Pressure Indicator (Manometer)



Factors That May Influence System Pressures

Lower Plenum

- Poorly Sealed Thermopile Wires
- Poorly Sealed Access Doors / Gaskets

Air Metering Plate / Cooling Manifold

- Poorly Sealed
- Residue Buildup on Holes / Incorrect Diameter

Second Stage Plate

- Poorly Sealed Perimeter
- Residue Buildup on Holes / Incorrect Diameter



OSU Standard Operating Procedures

- Develop Cold / Hot Checklist
- OSU Pressure Checks?
- Heat Flux Gauge

Calibration

Care

Operation

Mounting

- Verifying HF / Uniformity



OSU Standard Operating Procedures

- Standardized Thermopile (Hot Zone Indicating Range, Total Resistance Criteria, Construction etc.)
- Methane Gas Calibration Procedures
- Pilot Burners (Upper / Lower)
- Standard Calibration / Operating Parameters (mV ranges)
- Sample Preparation
- Testing
- Maintenance
- Troubleshooting



Chapter HR Update

Part IV—Test Method To Determine the Heat Release Rate From Cabin Materials Exposed to Radiant Heat.

(g) *Criteria.* The **total positive heat release over the first two minutes** of exposure for each of the three or more samples tested must be averaged, and the peak heat release rate for each of the samples must be averaged. The average total heat release must not exceed 65 kilowatt-minutes per square meter, and the average peak heat release rate must not exceed 65 kilowatts per square meter.

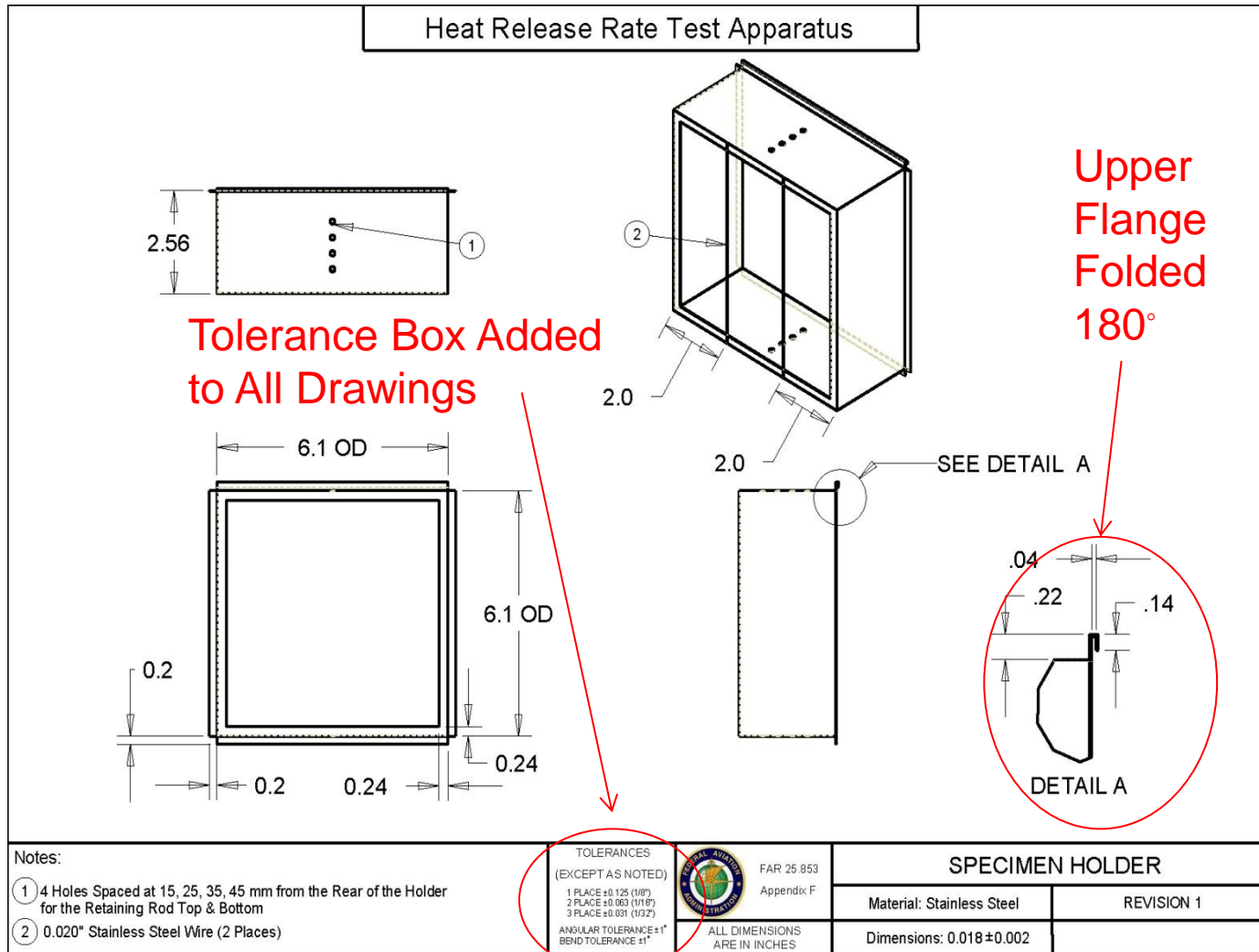
HR.8 Presentation of Results

For all specimens tested, determine and record the maximum heat release rate during the 5-minute test. Also, compute and record the total heat released during the first 2 minutes of testing (in the worst-case direction) by integrating the heat release rate over time.

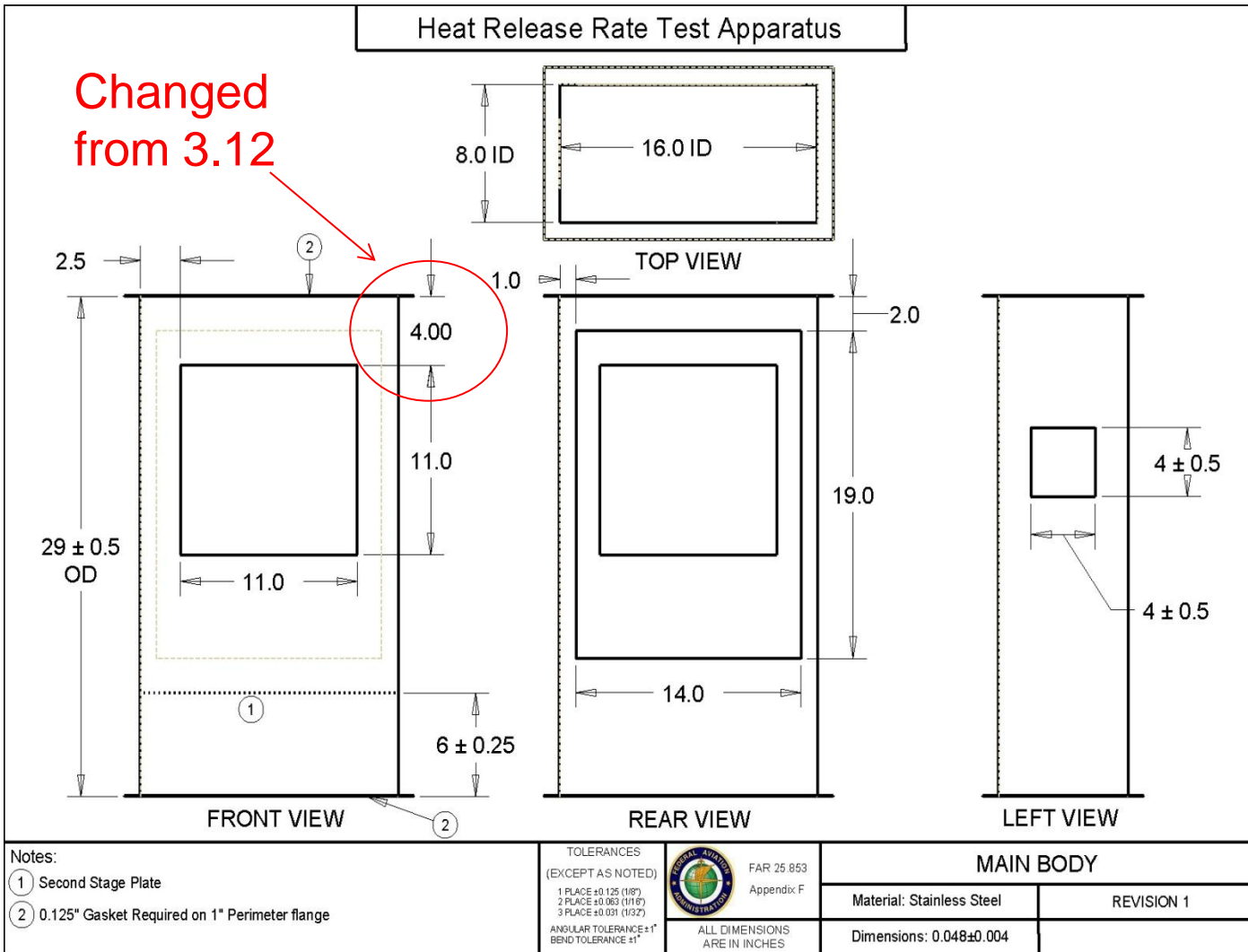
When calculating the total heat release, **only positive heat release rate values are included in the summation.**



Chapter HR Update

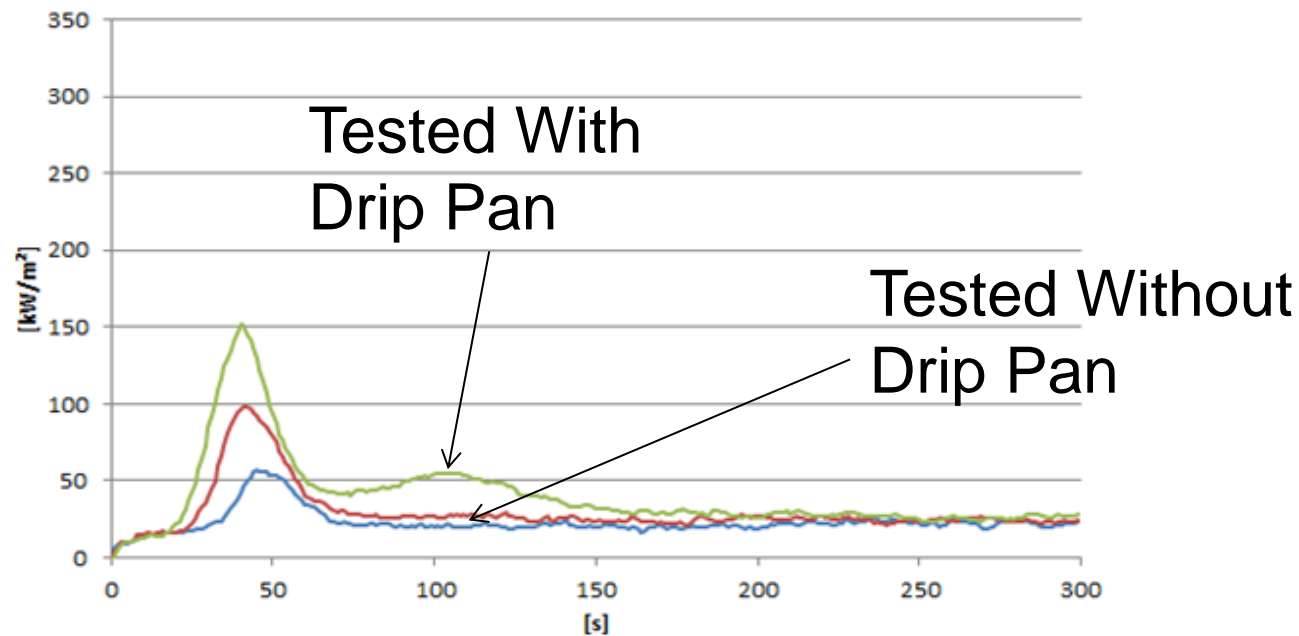


Chapter HR Update



Chapter HR Task Group Discussion

- Standardize Drip Pan Use? (Example shows 3 similar “dripping” materials)



- Standard Reference Panel Research

Chapter HR Supplement / Appendix

Planning Has Begun on Film Production of Test Method



FUTURE WORK

- Develop Pre-Checklist for Future OSU Round Robin
- Develop Two Part Conformity Check List to Support New Chapter HF

Assist Calibration Entities / Certification Officials Validate Conformance To The Document.

PART I

Equipment / Specifications / Dimensions

PART II

Data Acquisition / Operation / Misc.



H V A V S E F S U S X M H I E H P X M V F A
 R J Z E U L E W R S Q L P N E N A H J O Z Q
 G N I Q B I T E X E J N J N L W A V I R G U
 T O X E K P A S C J T V T E T E I L V U A E
 P I B X X O L A Y M O D D R B T R C Q R R R
 C T U H C M P E O Y T C H P R T D E D D D A
 J C G I U R E L R A A A T Y E E I T Q I O B
 V N K I U E G E I R L L U R N S S W B M N O
 M U L E D H A R F M H I K A R T T C R A O L
 N J Y V Q T T T I E R B B M U M R Z F R H G
 O E U L C K S A C T N R M I B E I B C Y Y G
 I C K C P F D E E H V A X D T T B N H P W J
 T N F A B J N H P A G T C U O E U S E R X D
 A E E L A J O K L N V I D P L R T E A E S B
 L R L I K N C N A E E O Y I I R I E T T M A
 U E P B O R E S T D A N E Q P U O T F U B Y
 S F M R H S S Q E I U F N V Q Q N X L O E V
 N E A A R H K A E P S A M D B E P G U V V V
 I R S T G R G D K S O C I U S R L P X T Y T
 A P U E N O Z U H L M T H X A T A S Q U W P
 R E N R U B T F I B B O C S U J T N N I Y F
 H Q Z L D F I H P R E R V Y V O E E Z M O F

airdistributionplate
 calibrate
 calibrationfactor
 chimney
 foil
 gardon
 globar
 heatflux

heatrelease
 innerpyramid
 insulation
 methane
 orificeplate
 osu
 outerpyramid
 peakhr

pilotburner
 referencejunction
 sample
 secondstageplate
 tburner
 thermopile
 totalhr
 wettestmeter

