

April 27, 2023

Plumis Ltd.  
Mr. Jinwen Cen  
Unit 4 Phoenix Trading Estate Bilton Road  
Perivale, UB6 7DZ  
GB

Reference: File EX27607, Project 4790418313

Subject: Preliminary Investigation for Fire Testing of Plumis Model SH12\_AE SmartScan  
Multiroom Spray Head, Non-Automatic (Open) Type Water Mist Nozzles

Dear Mr. Cen,

This will serve as a report of our findings under the subject investigation.

Samples of the subject product were tested at our Northbrook, IL test facility. Please note that the test procedure and compliance criteria used in this evaluation are contained in a UL Outline of Investigation that remains in Draft state as of the date of this Letter Report:

Standard	Title	Edition	Date
UL Subject 2167B	(Working title, subject to change) Outline of Investigation for Targeting Water Mist System Units for One and Two Family Dwellings for Fire Protection Service	DRAFT	DRAFT

The applicability of all test results towards UL Listing will be reviewed and determined as a part of a final Certification project after UL Subject 2167B has been finalized and published. Please note that due to the draft nature of the requirements the applicability of test data is not guaranteed, and further testing may be required. **The Model SH12\_AE SmartScan Multiroom Spray Head, Non-Automatic (Open) Type Water Mist Nozzles are not considered UL Listed as of the date of this Letter Report.**

Because of the preliminary nature of this investigation, it is understood that your Application will constitute your agreement not to use the name of Underwriters Laboratories, any abbreviation thereof, or symbol therefore, nor to permit such use by others, in connection with the release, publication, or other dissemination of the information obtained under this Application, unless specifically authorized in writing by Underwriters Laboratories. This Letter Report covers only the data developed by the investigation.

The following tests were successfully completed under this investigation (reference Note 1 below the table):

Test Number	Far Wall*	Near Wall*	Obstructions	Small Room – Nominally 15 ft. by 26 ft.	Large Room – Nominally 18 ft. by 38 ft.
1	A			X	
2		A		X	
3	B			X	
4		B		X	
5	C			X	
6		C		X	
7	D			X	
8	X** – Obstructions Close to Nozzle		Yes	X	
9		X** – Obstructions Close to Nozzle	Yes	X	
10	X** – Obstructions Far from Nozzle		Yes	X	
11		X** – Obstructions Far from Nozzle	Yes	X	
12	E			X	
13	A				X
14	B				X
15	A		Yes		X
16	B		Yes		X

\* Fuel Package Definition:

- A – Fabricated Sofa with plywood
- B – UL 2167 simulated furniture with plywood
- C – UL 2167 simulated furniture with drapes
- D – Cooking oil fire (kitchen)
- E – Fabricated sofa in room center

\*\* - X = Worst case test from test numbers 1 - 6

NOTE 1: All results are based on the Compliance Criteria contained in the most current Draft of UL Subject 2167B as of the date of this Letter Report. They are subject to change when the Outline of Investigation is finalized and published. All results will be reviewed for applicability towards Listing as a part of the final Certification project for the system.

It should be noted that the sixteen fire tests conducted under this investigation were utilizing your computer algorithm designated as follows:

Released : Jul 4 2022 13:34:35

Algorithm :

Base : a255e4e

Bottleneck : df8acb9

Location : 682c5ab

Controller : v1.5\_AH-0-da27e88

We understand that a revision to the above reference software was necessary to complete another UL engineering evaluation. The final revision to the software will need to be properly evaluated under the final Certification project for the system.

A copy of the data sheets are provided as an Appendix to this letter report for your reference.

The completes the scope of work anticipated under Project 4790418313. We are closing the project with this letter.

Should you have any questions or comments concerning the above, please feel free to contact the undersigned.

Sincerely,

Reviewed by,



Daniel Steppan  
Senior Staff Engineer  
UL Solutions

Christopher Dostal  
Senior Project Engineer  
UL Solutions

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

## **Appendix A – Data Sheet Package**

Number of pages in this package 108 [ including additional pages \_\_-\_\_ ]  
 (Fill in when using printed copy as record)

TEST LOCATION:					
<input checked="" type="checkbox"/> UL or Affiliate	<input type="checkbox"/> WTDP	<input type="checkbox"/> CTDP	<input type="checkbox"/> TPTDP	<input type="checkbox"/> TCP	<input type="checkbox"/> PPP
	<input type="checkbox"/> WMT	<input type="checkbox"/> TMP	<input type="checkbox"/> SMT		
Company Name UL LLC					
Address 333 Pfingsten Road Northbrook, IL 60062					

CLIENT INFORMATION	
Company Name	Plumis Ltd.
Address	Unit 4 Phoenix Trading Estate Bilton Road Perivale, UB6 7DZ GREAT BRITAIN

AUDIT INFORMATION:			
Description of Tests	Per Standard No.	UL 2167 B - Draft Outline of Investigation for Targeting Water Mist System Units for One and Two Family Dwellings for Fire Protection Service*	Edition/ Revision Date
			Not Published
<input checked="" type="checkbox"/> Tests Conducted by +	RAY HOULIHAN 03067 CARISA HERNANDEZ 22922 DEREK DZIEKONSKI 47166		<i>Ray Houlihan 03067</i> <i>Carisa Hernandez 22922</i> <i>Derek Dziekonski 47166</i>
	Printed Name		Signature
<input type="checkbox"/> UL Staff conducting or witnessing testing (WTDP, TMP, WMT only)			
<input type="checkbox"/> UL Staff supervising UL Staff in training			
<input type="checkbox"/> Authorized Signatory (CTDP, TPTDP, TCP, PPP, SMT)	Printed Name		Signature, and include date for CTDP, TPTDP, TCP, PPP, WMT, TMP, SMT
Reviewed and accepted by qualified Project Handler	Printed Name		Signature

\* Draft Outline Issue Number 1 dated November 10, 2022 with revisions through January 9, 2023. This data in this Preliminary Investigation will be reviewed once the Outline has been published to determine compliance and applicability towards UL Certification.

TESTS TO BE CONDUCTED:			
Test No.	Done+++	Test Name	<input checked="" type="checkbox"/> Comments/Parameters <input type="checkbox"/> Tests Conducted by ++
1	July 7, 2022	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	Fabricated Sofa with Combustible Wall - Far Wall Test - No Obstructions - Small Room for Single Nozzle Coverage Area
2	July 7, 2022	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	Fabricated Sofa with Combustible Wall - Near Wall Test - No Obstructions - Small Room for Single Nozzle Coverage Area
3	July 5, 2022	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	UL 2167 Residential Dwelling Units Fire Test with Combustible Wall - Far Corner Test - No Obstructions - Small Room for Single Nozzle Coverage Area
4	July 6, 2022	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	UL 2167 Residential Dwelling Units Fire Test with Combustible Wall - Near Corner Test - No Obstructions - Small Room for Single Nozzle Coverage Area
5	July 15, 2022	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	UL 2167 Residential Dwelling Units Fire Test with Drapes - Far Corner Test - No Obstructions - Small Room for Single Nozzle Coverage Area
6	July 14, 2022	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	UL 2167 Residential Dwelling Units Fire Test with Drapes - Near Corner Test - No Obstructions - Small Room for Single Nozzle Coverage Area
7	July 19, 2022	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	Kitchen Fire - Cooking Oil Test - Far Wall Test - No Obstructions - Small Room for Single Nozzle Coverage Area
7a	July 19, 2022	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	Kitchen Fire - Cooking Oil Test - Near Wall Test - No Obstructions - Small Room for Single Nozzle Coverage Area

TESTS TO BE CONDUCTED:			
Test No.	Done+++	Test Name	<input checked="" type="checkbox"/> Comments/Parameters <input type="checkbox"/> Tests Conducted by ++
8	July 8, 2022	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	Fire Considered Most Challenging from Test Numbers 1-7; Fabricated Sofa with Plywood - Far Wall Test - Obstruction Near Nozzle - Small Room for Single Nozzle Coverage Area
9	July 11, 2022	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	Fire Considered Most Challenging from Test Numbers 1-7; Fabricated Sofa with Plywood - Near Wall Test - Obstruction Near Nozzle - Small Room for Single Nozzle Coverage Area
10	July 12, 2022	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	Fire Considered Most Challenging from Test Numbers 1-7; Fabricated Sofa with Plywood - Far Wall Test - Obstruction Near Fuel Package - Small Room for Single Nozzle Coverage Area
10a	July 13, 2022	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	Fire Considered Most Challenging from Test Numbers 1-7; UL 2167 Residential Dwelling Units Fire Test with Combustible Wall - Far Wall Test - Obstruction Near Fuel Package - Small Room for Single Nozzle Coverage Area
11	July 14, 2022	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	Fire Considered Most Challenging from Test Numbers 1-7; UL 2167 Residential Dwelling Units Fire Test with Combustible Wall - Near Wall Test - Obstruction Near Fuel Package - Small Room for Single Nozzle Coverage Area
12	July 21, 2022	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	Fabricated Sofa near Center of Room - no Obstruction - Small Room for Single Nozzle Coverage Area
13	February 2, 2023	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	Fabricated Sofa with Combustible Wall - No Obstructions - Large Room for Multiple Nozzle Coverage Area
14	February 6, 2023	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	UL 2167 Residential Dwelling Units Fire Test with Combustible Wall - No Obstructions - Large Room for Multiple Nozzle Coverage Area

TESTS TO BE CONDUCTED:			
Test No.	Done+++	Test Name	<input checked="" type="checkbox"/> Comments/Parameters <input type="checkbox"/> Tests Conducted by ++
15	February 7, 2023	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	Fabricated Sofa with Combustible Wall - With Obstructions near fuel package - Large Room for Multiple Nozzle Coverage Area
16	February 6, 2023	TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests	UL 2167 Residential Dwelling Units Fire Test with Combustible Wall - With Obstructions near nozzle - Large Room for Multiple Nozzle Coverage Area

Instructions -

- + - When all tests are conducted by one person, printed name and signature can be inserted here instead of including printed name and signature on each page containing data. Must indicate number of pages in the data package.
- ++ - When test conducted by more than one person, printed name and signature of person conducting the test can be inserted next to the test name instead of including printed name and signature on each page containing data. Must indicate number of pages in the data package.
- +++ - Use of this field is optional and may be employed differently.

Special Instructions -

Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be recorded at the time the test is conducted.

Ambient	Relative	Barometric
Temperature, F <u>80±5</u>	Humidity, % <u>NO REQ</u>	Pressure, mBar <u>NO REQ</u>

No general environmental conditions are specified in the Standard(s) or have been identified that could affect the test results or measurements.

Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

## TEST EQUIPMENT INFORMATION

(For Test Numbers 1-12 Conducted July 5-21, 2022)

Department 3019FPD Instrument Calibration Tracking  
Procedure: 040 SPRINKLER BLD.2

Test Dates: 2022-06-15

File Number: EX27607  
Customer: PLUMIS

Assignment Number: 4790418313

## Software:

FPD ID / LEM ID	Description	Version	Version Date
2F05DPP/34112	Software/Multi-range	1.1.0	2008-10-03

## Instruments

FPD ID / LEM ID	Description	Range	Last Cal	Next Cal
220F16MT/139447	MEASURING TAPE	0-360 inches	2021-09-07	2022-09-30
243F11MD/71369	MEASURING DEVICE	LEVEL	2022-04-04	2023-04-30
382F18MD/174170	MEASURING DEVICE	90	2021-07-07	2022-07-31
230F17SW/158398	STOPWATCH	99:59:59	2022-03-16	2023-03-31
25FA2TI/21815	THERMOMETER	50-400 DEGF	2022-04-13	2023-04-30
111F16THI/94181	TEMP./HUMIDITY INDICATOR	Multi-range	2022-01-19	2023-01-31
57F01SCL/21858	SCALE	0-12100 GRAMS	2022-01-25	2022-07-31
58F02SCL/21859	SCALE	0-200 LBS	2022-01-25	2022-07-31
204F18CLK/175943	CLOCK	24	2022-01-18	2023-01-31
56F65DAS/20754	DATA ACQUISITION SYSTEM	Multi-range	2021-11-17	2022-11-30
135F08IC/52685	INPUT CARD	TC comp only	2021-11-17	2022-11-30
154F13DAS/80169	DATA ACQUISITION SYSTEM	Multi-range	2022-06-14	2023-06-30
63F02IC/20650	INPUT CARD	TC comp only	2022-06-14	2023-06-30
312F14PG/83494	PRESSURE GAUGE	0 - 5000	2021-09-03	2022-09-30
336F16FM/94200	FLOW METER	1.2 - 31 GPM	2021-09-14	2022-09-30
419F20PG/201489	PRESSURE GAUGE	0-1999 PSI	2021-10-11	2022-10-31
310F14PG/83496	PRESSURE GAUGE	0 - 5000	2022-07-07	2023-07-31

## THERMOCOUPLES

FPD ID / LEM ID	Description	Type	Last Cal	Next Cal
0430080005/52163	Thermocouple	Type K	2021-08-11	2022-08-31
0806190001/183302	Thermocouple	Type K	2021-09-21	2022-09-30
0806190002/183303	Thermocouple	Type K	2021-09-21	2022-09-30
0828170059/157888	Thermocouple	Type K	2021-09-21	2022-09-30
1126190013/191802	Thermocouple	Type K	2021-08-31	2022-08-31
1119080015/55574	Thermocouple	Type K	2021-09-21	2022-09-30
0828170058/157887	Thermocouple	Type K	2021-09-21	2022-09-30
0828170057	Thermocouple	Type K	2022-06-20	2022-06-30
0506220005/219973	Thermocouple	Type K	2022-05-06	2023-05-31
0428170004/154618	Thermocouple	Type K	2022-06-20	2023-06-30

Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

TEST EQUIPMENT INFORMATION - Continued  
(For Test Numbers 1-12 Conducted July 5-21, 2022)

## Environmental Area

FPD ID / LEM ID	Description
554/51880	Lumber room 2

## Environmental software

FPD ID / LEM ID	Description	Validation Date
29F17DLP/159202	DATA LOGGING PROGRAM/Environmental Monitoring System	(2017-03-13)

## Environmental Instruments

FPD ID / LEM ID	Description	Range	Last Cal	Next Cal
154F13DAS/80169	DATA ACQUISITION SYSTEM	Multi-range	2022-06-14	2023-06-30
63F02IC/20650	INPUT CARD	TC comp only	2022-06-14	2023-06-30
111F16THI/94181	TEMP./HUMIDITY INDICATOR	Multi-range	2022-01-19	2023-01-31

TEST EQUIPMENT INFORMATION  
(For Test Numbers 13-16 Conducted February 2-7, 2023)

UL test equipment information is recorded on Meter Use in UL's Laboratory Project Management (LPM) database.

Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

## TEST SAMPLE IDENTIFICATION:

The table below is provided to provide correlation of sample numbers to specific product related information. Refer to this table when a test identifies a test sample by "Sample No." only.

Sample Card No.	Date Received	[ ] Test No.+	Sample No.	Manufacturer, Product Identification and Ratings
4970135	2022-06-01	1-16	1 Box	Nittan Smoke Detectors for Fire Testing - Least Sensitive from Factory
4986233	2022-06-13	1-16	10 Boxes	Fire Testing Equipment for Bldg. 2 Fire Series - Boxes
5025372	2022-06-13	1-16	1 Box	Sample Bases for Nittan Smoke Detector - UL Fire Test Series

+ - If Test Number is used, the Test Number or Numbers the sample was used in must be identified on the data sheet pages or on the Data Sheet Package cover page.

[ ] Sampling Procedure -

Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

### Special Instructions -

Create a standard UL 1626 Residential fire test room, See Figure 1 for the small room series (tests 1-12) and Figure 8 and 9 for the large room series (tests 13-16).

Work with engineering to fabricate the newly developed standardized couch regarding cutting of plywood and fastening to metal frame.

Harden room against the potential a non compliant test with Densdeck to allow the fire to continue for at least 10-20 seconds past flames out of the back doorway.

The embedded thermocouple above ignition will need to be in a different location, depending on fire origin.

See following figures for instrumentation and fuel package placement.

Tested by: \_\_\_\_\_

Printed Name

Signature

Date \_\_\_\_\_

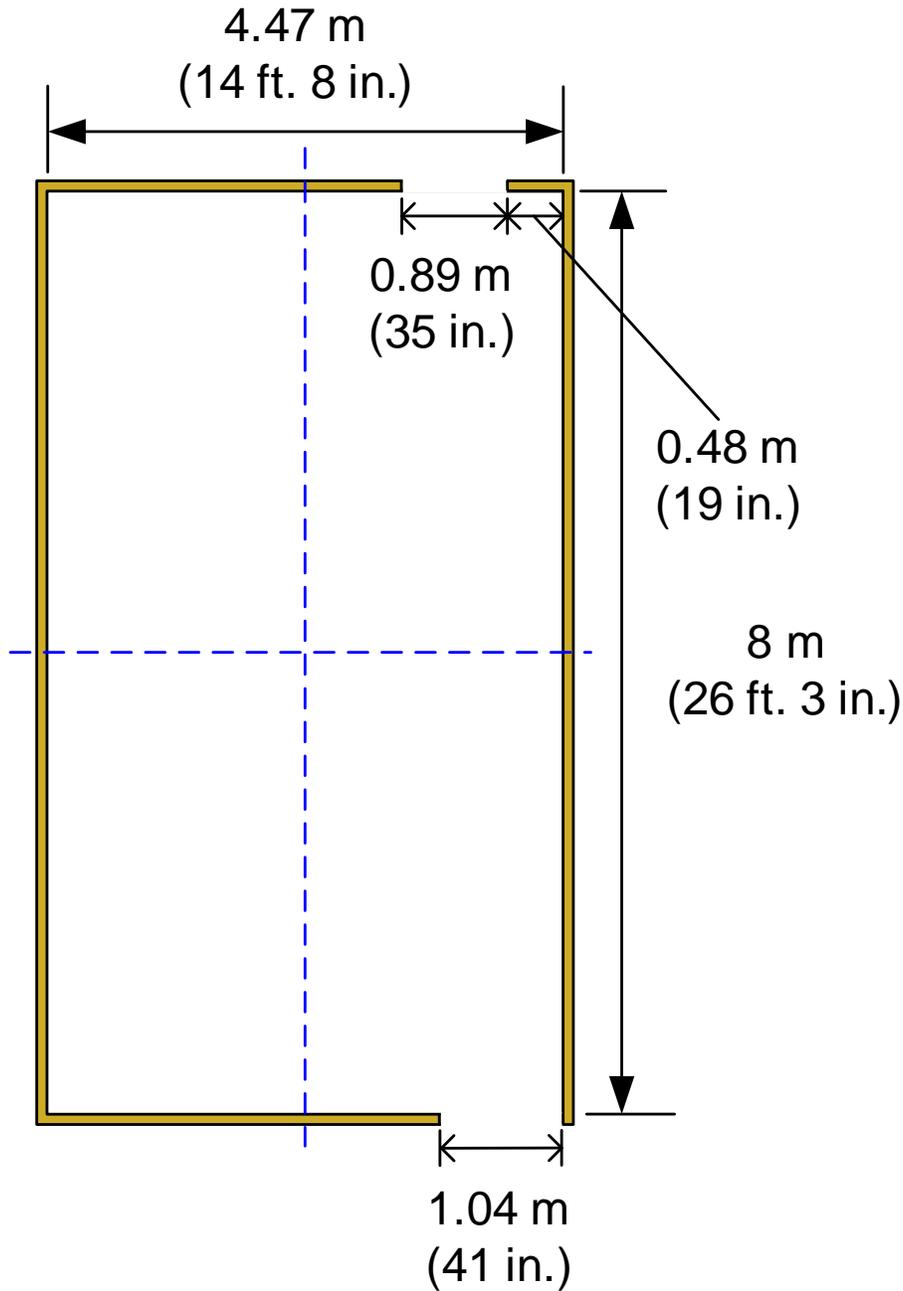


Figure 1: Small Room Construction

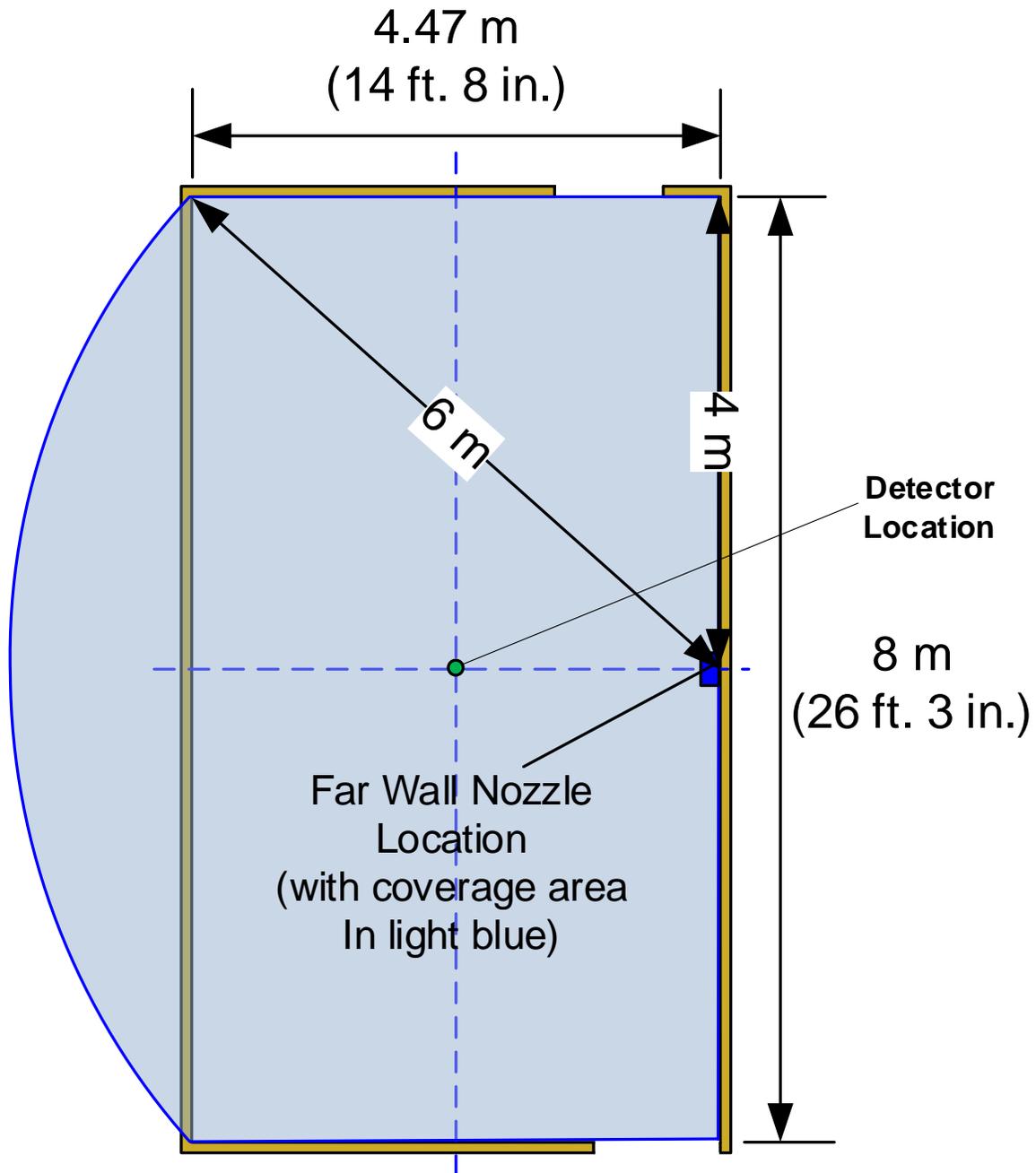


Figure 2: Nozzle Location for Far Wall - Small Room (showing coverage area limits of the single nozzle as light blue shading)

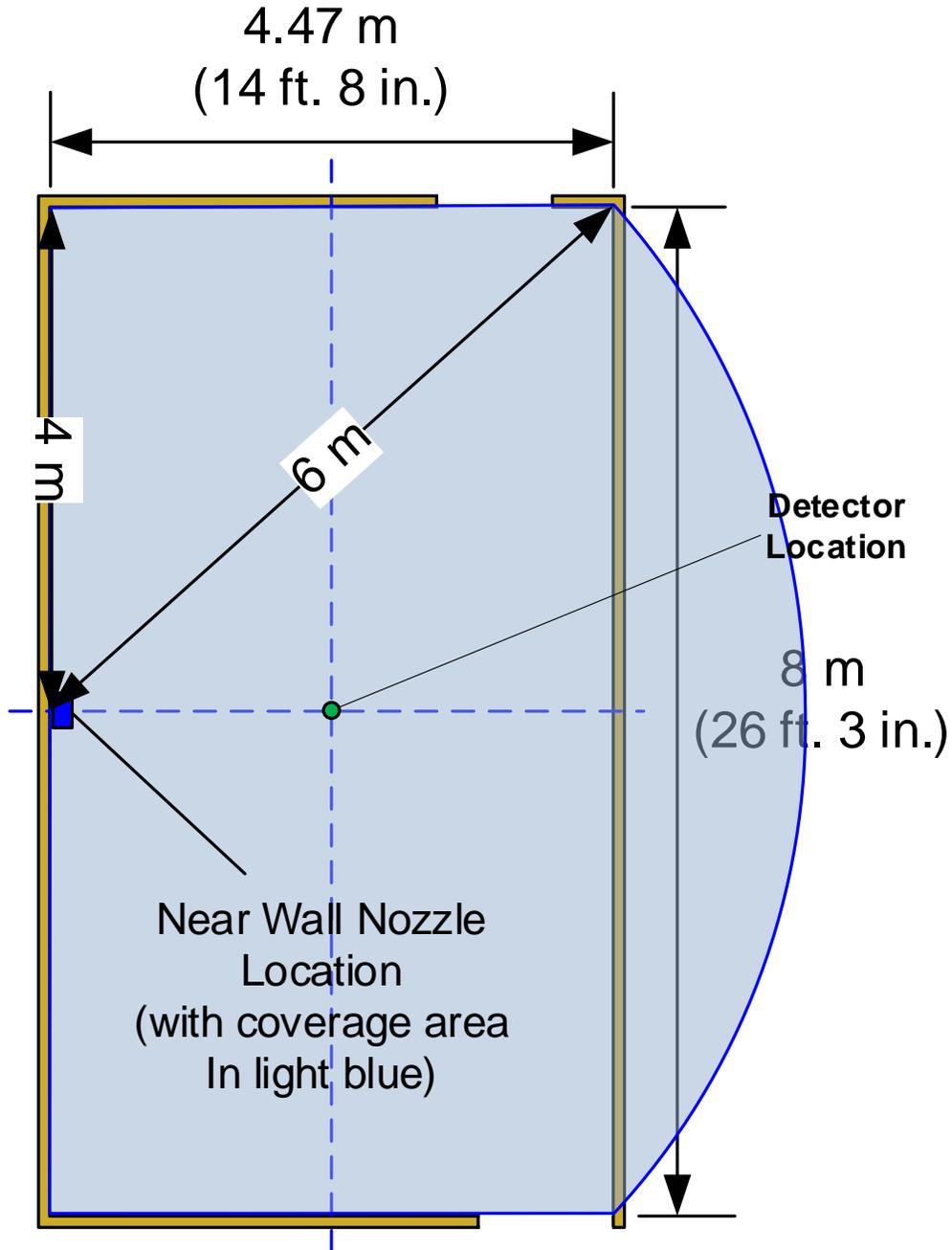


Figure 3: Nozzle Location for Near Wall - Small Room (showing coverage area limits of the single nozzle as light blue shading)

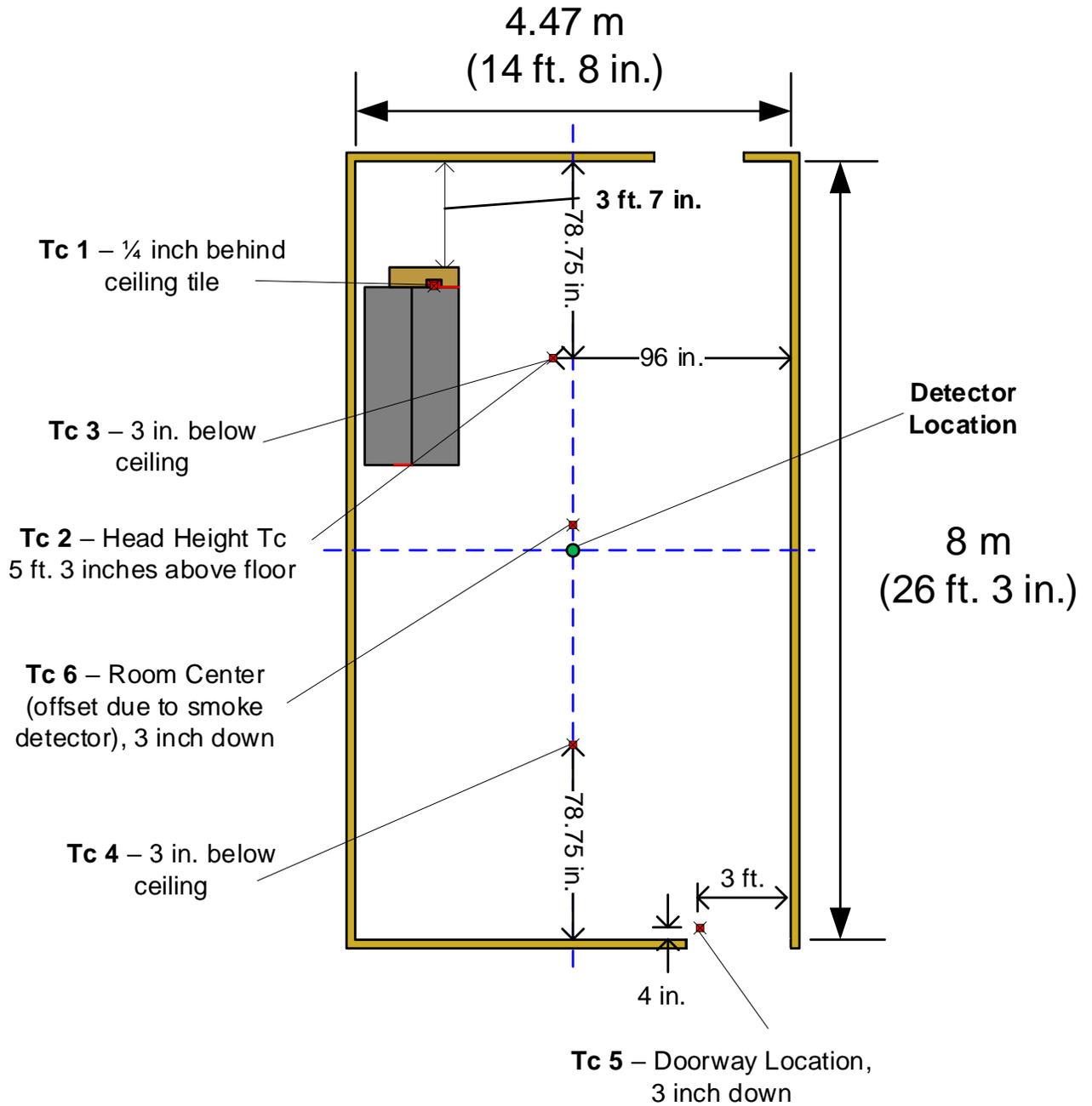


Figure 4: Instrumentation and Fuel Package - Tests 1 and 2

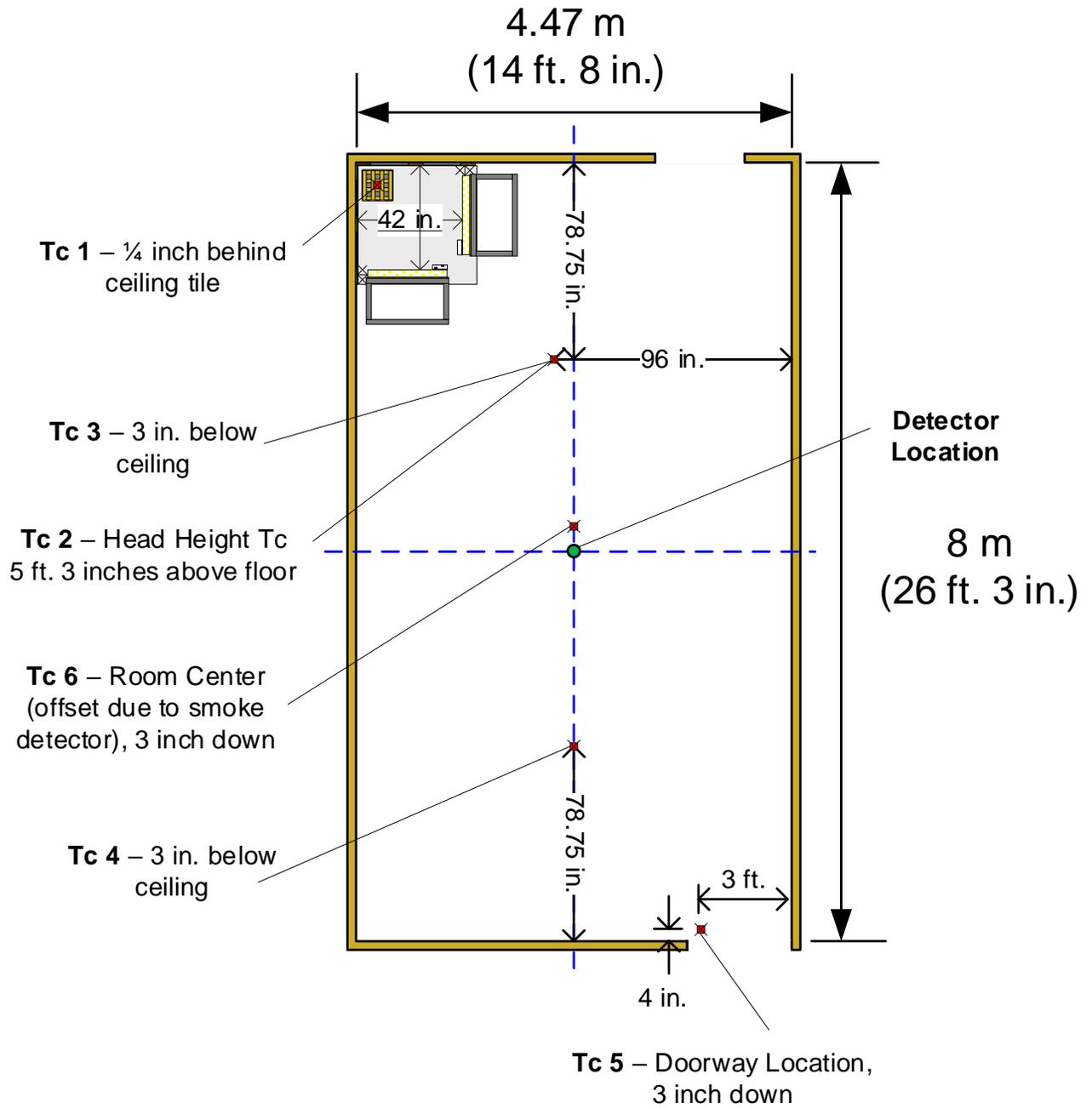


Figure 5: Instrumentation and Fuel Package - Tests 3 and 4

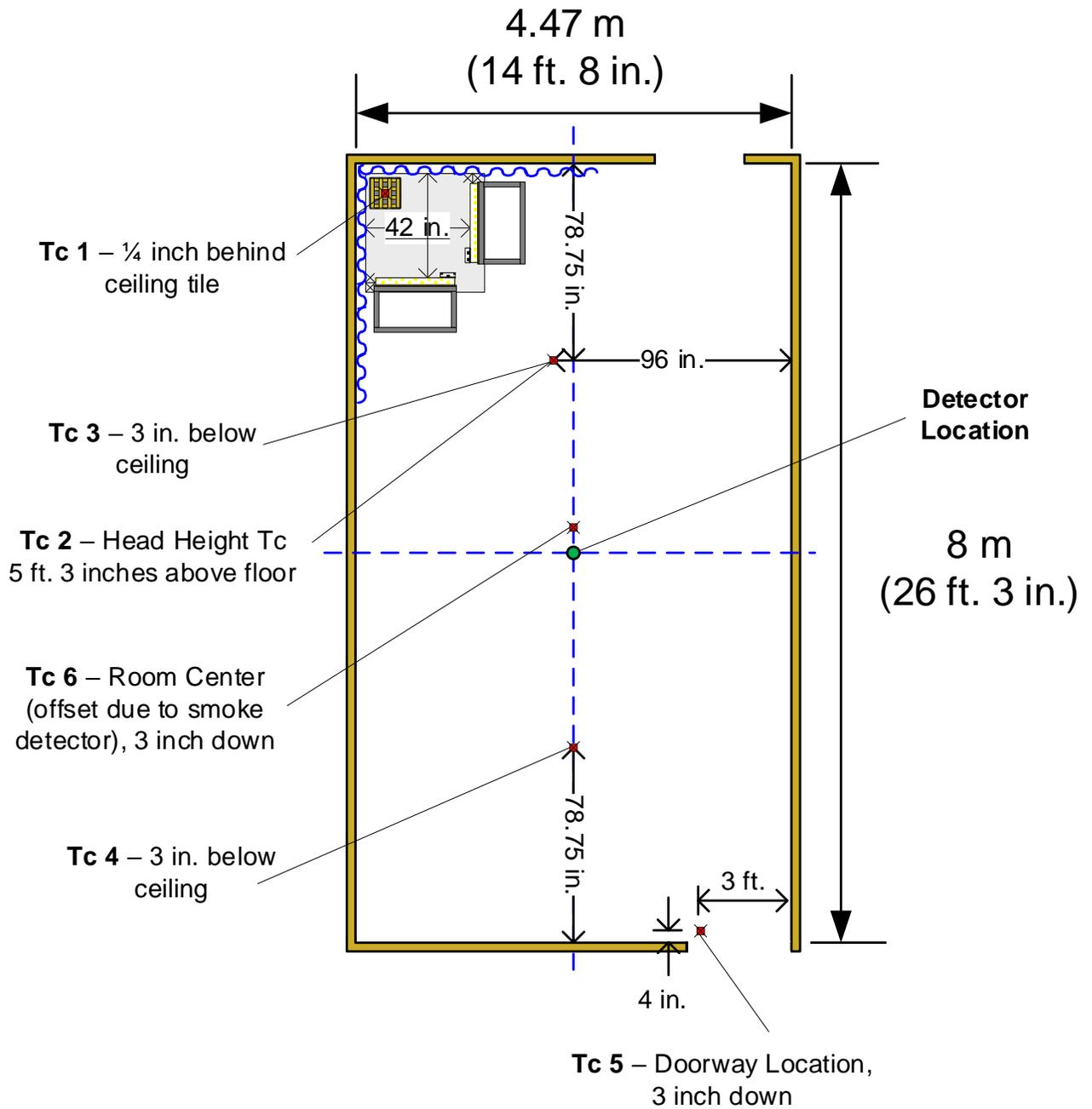


Figure 6: Instrumentation and Fuel Package - Tests 5 and 6

### Test 7 and 7a – Cooking Oil Fire

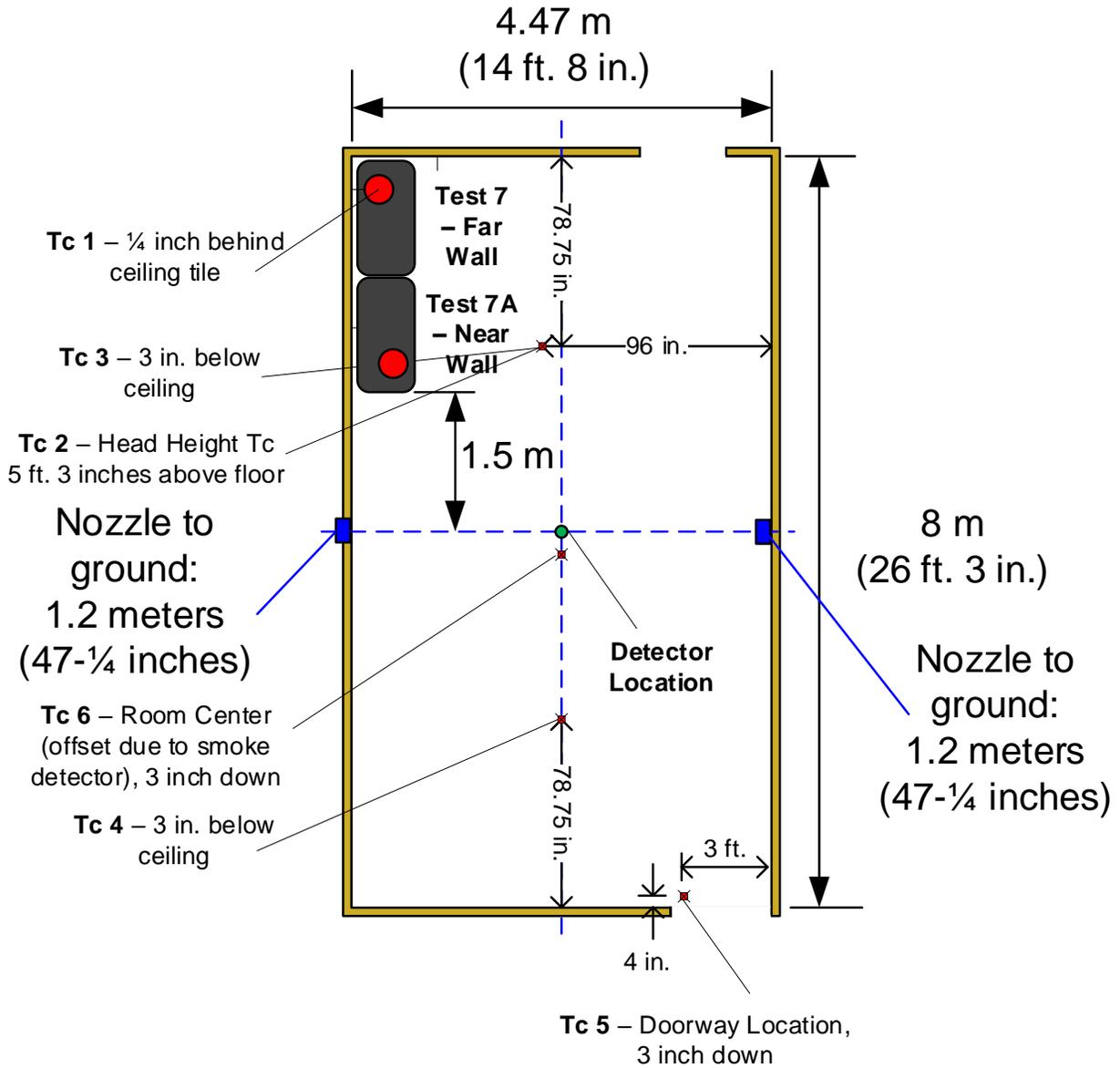


Figure 7: Instrumentation and Fuel Package – Tests 7 and 7a

(Grey rectangle represents a 2 ft. by 4 ft. plan view island with the red circle representing a skillet with Canola oil)

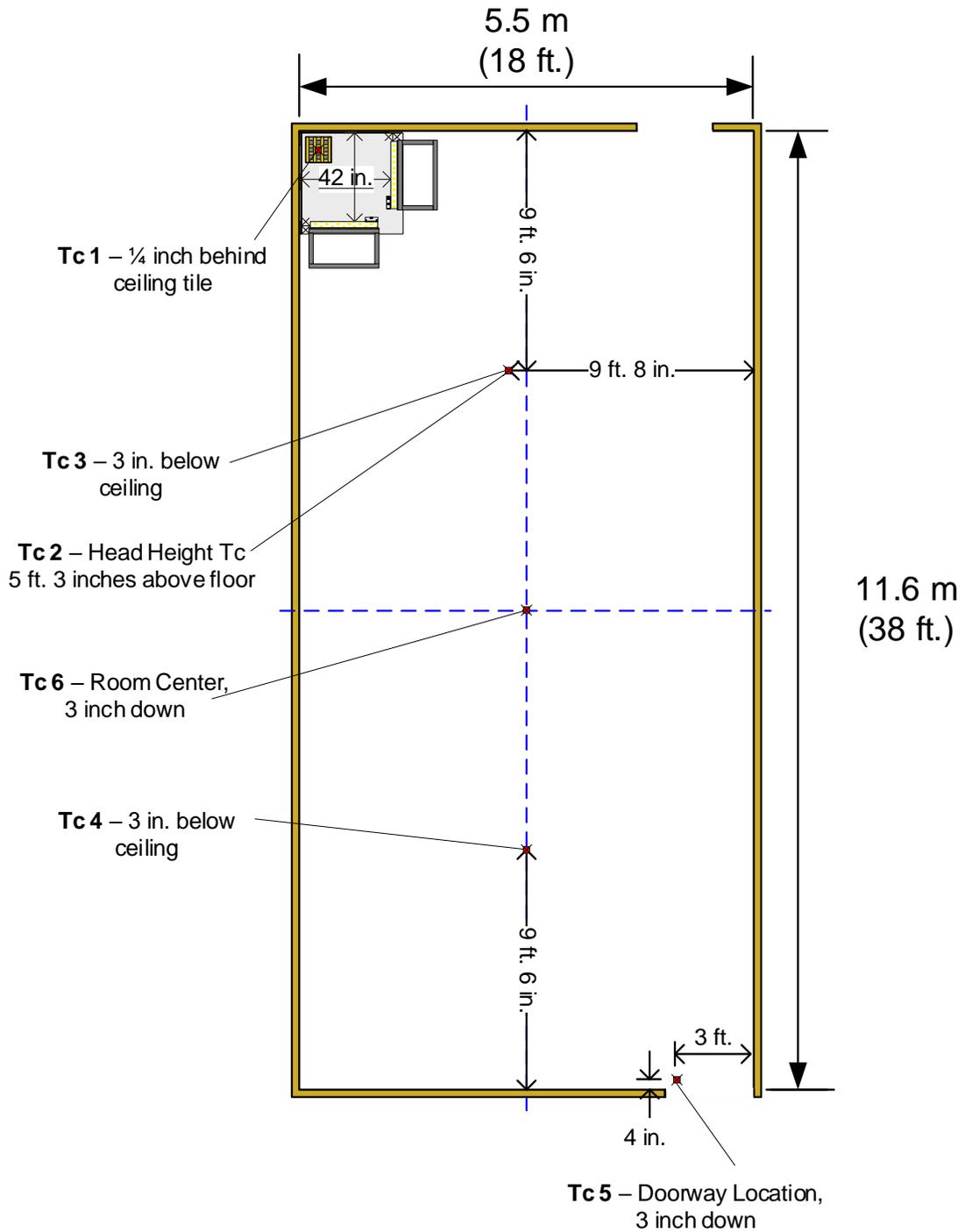


Figure 8: Large Room Construction with Tc Layout for UL 2167 Simulated Furniture (Tests 14 and 16)

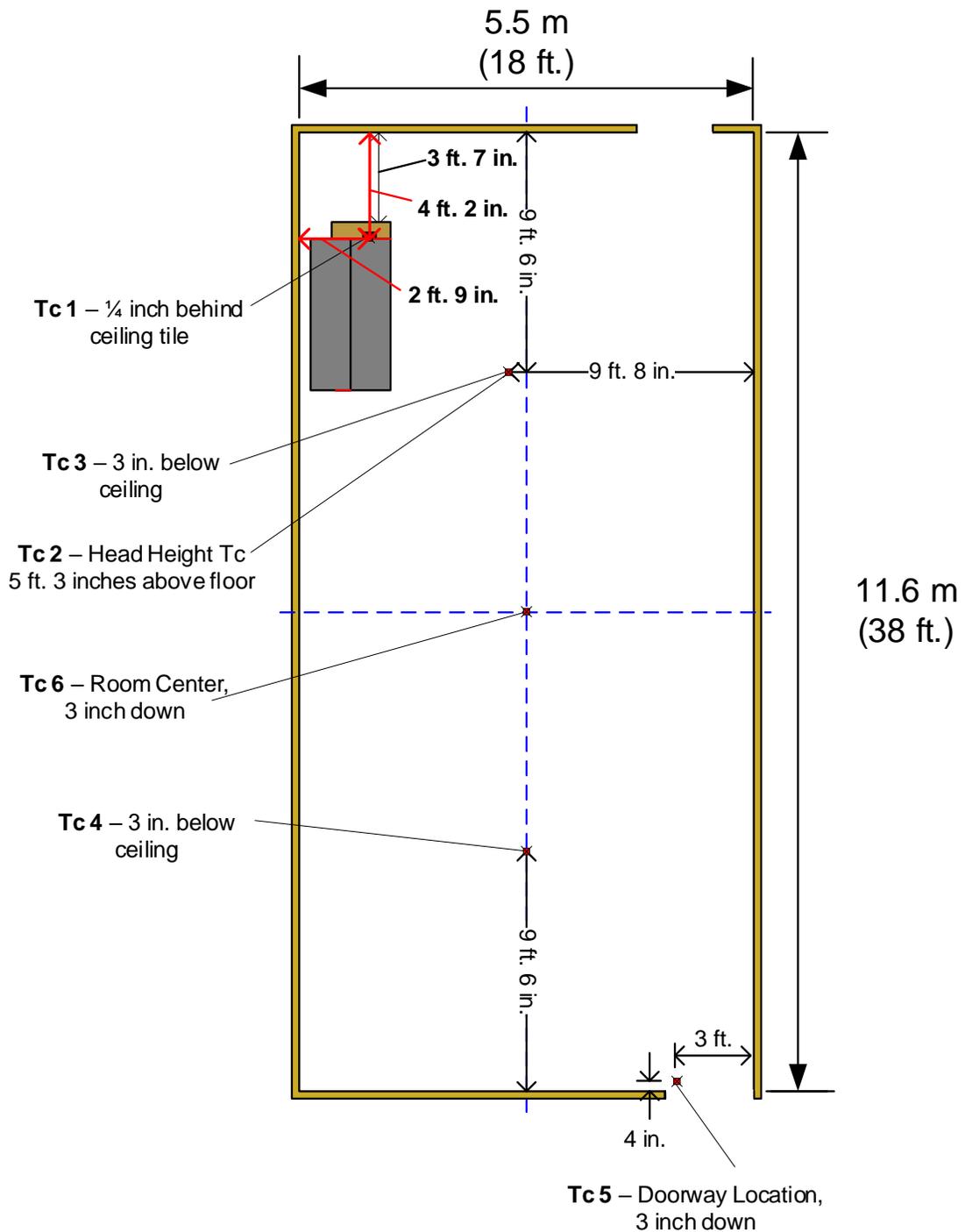


Figure 9: Large Room Construction with Tc Layout for Fabricated Sofa (Tests 13 and 15)

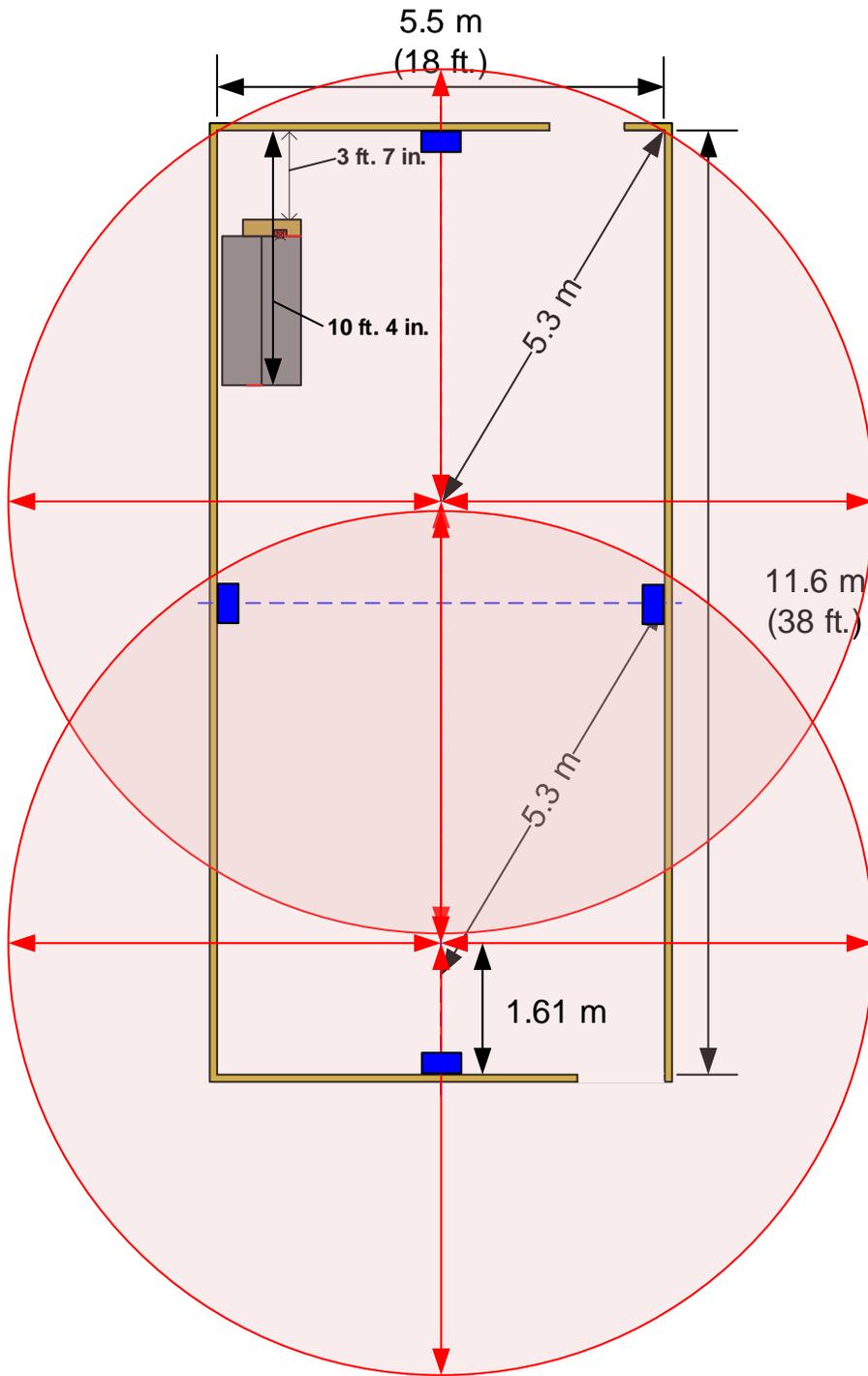


Figure 10: Nozzle Locations - Blue Rectangle (centered on four walls)  
Smoke Detector Locations - center of red circle (aimed at fire origin for longest delay)

Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

**Residential Fire Check List - ALL Tests (as appropriate for fuel package used)**

The following items were performed, checked, or verified before each test:

X	Cement board replaced
X	Two ceiling tiles above fire replaced
X	Doorways are the proper width, baffles are at the proper height
X	All thermocouples are installed, dried, shield in place, and working properly
X	Thermocouples indicate ambient room temperatures
X	Fire test room is clean, and no visible water
X	Fire crib is conditioned at 220 °F for 24-72 hrs., 4 layers of 4, 12x12x6 (placed in plastic bags and allowed to cool to room temperature before testing)
X	16 oz. of water and 8 oz. of heptane in 12x12x4 in crib test pan
X	Fire crib is placed 2 in. from each wall in the corner
X	Foam pads are within weight tolerance, marked and weight recorded
X	Foam and 1/2 in plywood backing is conditioned at 70 °F, 40-60% humidity, for at least 24 hrs.
X	Plywood wall covering is conditioned at 70 °F, 40-50% humidity, for at least 72 hrs.
X	Furniture is 42 in. from face to wall, and 4 in. from edge to wall
X	Sprinkler piping is leveled and plumb
X	All nozzles are installed in the proper location
X	Recessed and concealed sprinklers are installed in their most recessed position
X	For tests requiring blocking of sprinkler escutcheon vents, 8-inch thick insulation is installed in a manner to block the airflow through the escutcheon
X	Piping is pressurized and vented of air
X	Attic fans and room heaters are shutoff; and Regen in static mode
X	Leaks checked at nozzle location before testing
X	Flows set for nozzle (set pressure with bypass flow)
X	Back up system is ready
X	Ignitors are 1/4 in. X 6 in. cotton rope, saturated with heptane
X	Ignitors are placed along the face of the foam at the center corners
X	Test parameters have been recorded on the pre-test screen
X	The data acquisition channel numbers have been recorded on the pre-test screen,

Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

**Residential Fire Mass List - Test 1**

Residential Fire Test Mass List							
<b>Test Number</b>	1	(1A)					
<b>Test Date</b>	July 7, 2022						
<b>Component Description</b>	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	<b>Volume Density</b>	<b>Area Density</b>	
	pounds	inches	inches	inches	pounds/ cubic foot	pounds/ square foot	
			<b>Requirement:</b>		1.6 - 1.9	0.046 - 0.053	
Back Cushion	13.55	72	24	8	1.69		
Seat Cushion	15.65	71.75	26.25	8	1.79		
Back Cushion fabric	2.20	164	42	n/a		0.046	
Seat Cushion fabric	2.20	164	42	n/a		0.046	
Stuffed Pillow 1 - Final	5.85	32.5	22	12.5			
Stuffed Pillow 2 - Final	5.90	32	20.5	12.5			
Stuffed Pillow 3 - Final	5.90	32.5	21	12.5			
	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>			
	grams	inches	inches	inches			
Armrest Foam 1	174.4	18	7	3	1.76		
Armrest Foam 2	172.3	18	7	3	1.74		
Stuffed Pillow Fabric 1 - Low	174.9	40	30	n/a		0.046	
Stuffed Pillow Fabric 1 - High	176.7	40	30	n/a		0.047	
Stuffed Pillow Fabric 2 - Low	175.5	40	30	n/a		0.046	
Stuffed Pillow Fabric 2 - High	173.6	40	30	n/a		0.046	
Stuffed Pillow Fabric 3 - Low	179.1	40	30	n/a		0.047	
Stuffed Pillow Fabric 3 - High	175.5	40	30	n/a		0.046	

Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room					
Test Number	1		Test Date	July 7, 2022	
Fire Test Code	07072202		Fuel Package	Fabricated Sofa with Plywood Wall Covering	
Tested per section	24	Of UL 2167B	Test Room	Building 2	
Test Configuration	Living Room		Room Size	14 ft. 8 in. by 26 ft. 3 in.	ft. by ft.
Operating Nozzle location with respect to fire	Far Wall		Algorithm Designation	v1.5_AH-0-da27e88	
Obstruction Detail	Not applicable (none)		Flowing Pressure	1,089	psig
Lateral position of nozzle in room	Centered on Far Wall		Nominal K-factor	0.072	gpm/psig <sup>0.5</sup>
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	51-1/8 (1.3 m)	in.
<b>Event</b>					
			<b>Operation Sequence, Time; min:sec</b>		
Smoke detector Operation Time (nozzle scanning start time)			0:28		
Pump Start			0:41		
Nozzle Discharge Start			1:04		
Test Duration			30:41		
<b>Trajectory Information</b>					
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees			139		
Coanda Compensated Angle, degrees			139		
			<b>Fire Angle</b>	<b>Coanda Angle</b>	<b>Pump On</b>
Fire chase feature detail			139	139	0:41
			117	117	3:07
			124.5	124.5	6:15
			117	117	8:09
					3:01
					6:09
					8:02
					30:41
<b>Thermocouple ID#</b>					
<b>Location</b>			<b>Maximum Ceiling Temperature, °F</b>		
Tc #1	Above Fire Embedded in Ceiling Tile			126	
Tc #2	5 ft. 3 in. above test room floor near fuel package			166	
Tc #3	3 inches below Ceiling Near "First Sprinkler"			367	
Tc #4	3 inches below Ceiling Near "Second Sprinkler"			268	
Tc #5	3 inches below Ceiling Near "Doorway Location"			265	
Tc #6	3 inches below Ceiling - Center of Room			310	
Tc #7	5 ft. 3 in. above test room floor (Centered on Room)			Not taken	
<b>Thermocouple Location (ID#)</b>					
<b>Temperature Criteria</b>			<b>Results</b>		
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)			Cannot exceed 500°F		
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)			Cannot exceed 200°F		
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)			Cannot exceed 600°F		
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)			Cannot exceed 600°F		
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)			Cannot exceed 200°F		
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F			Cannot exceed 130 °F for 120 seconds		
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F			Cannot exceed 130 °F for 120 seconds		
A - Acceptable B - Unacceptable N/A - Not Applicable					
Comments:					

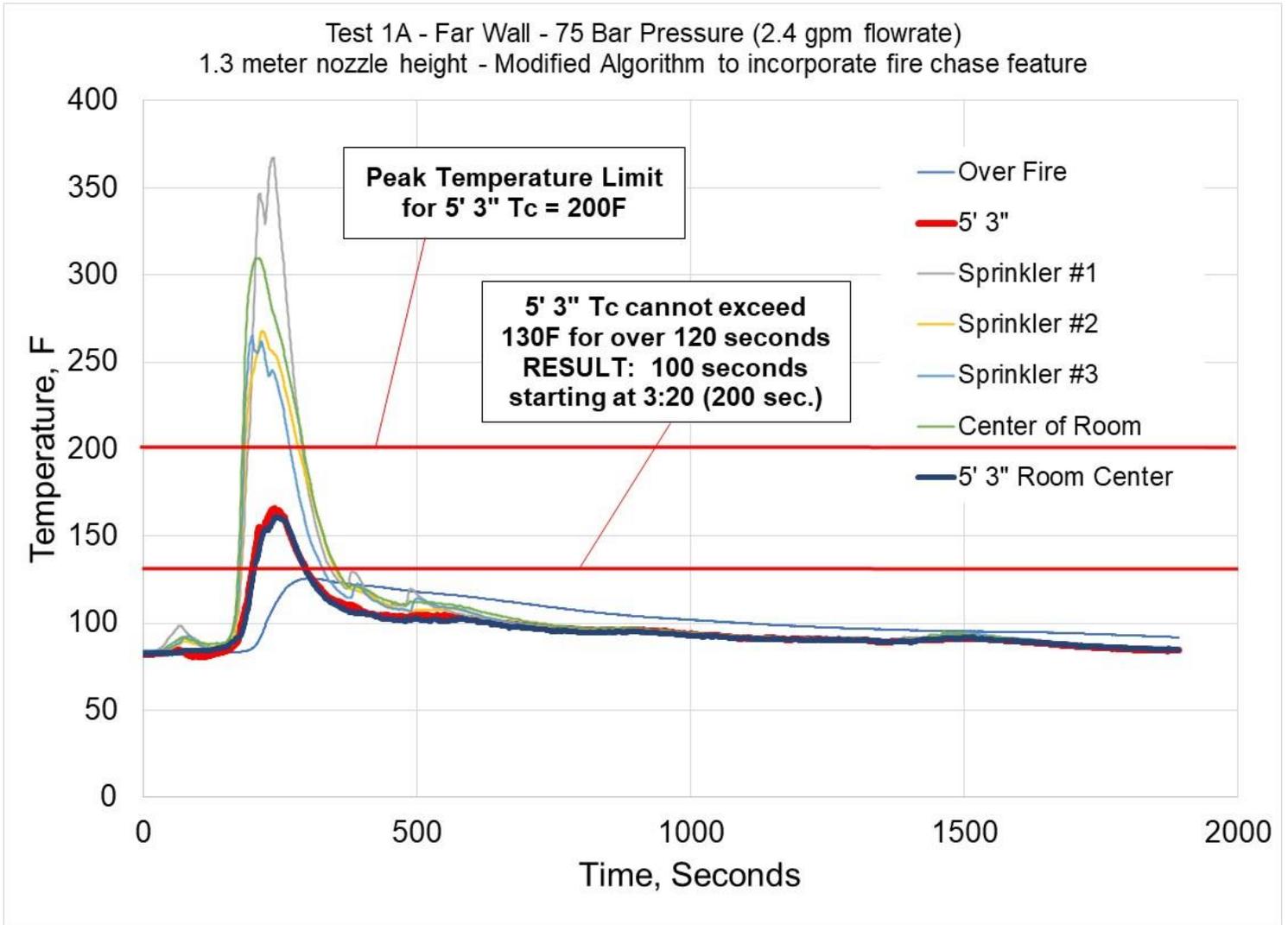
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Date \_\_\_\_\_

Printed Name

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**Residential Fire Test Data - Full Test - Test 1**



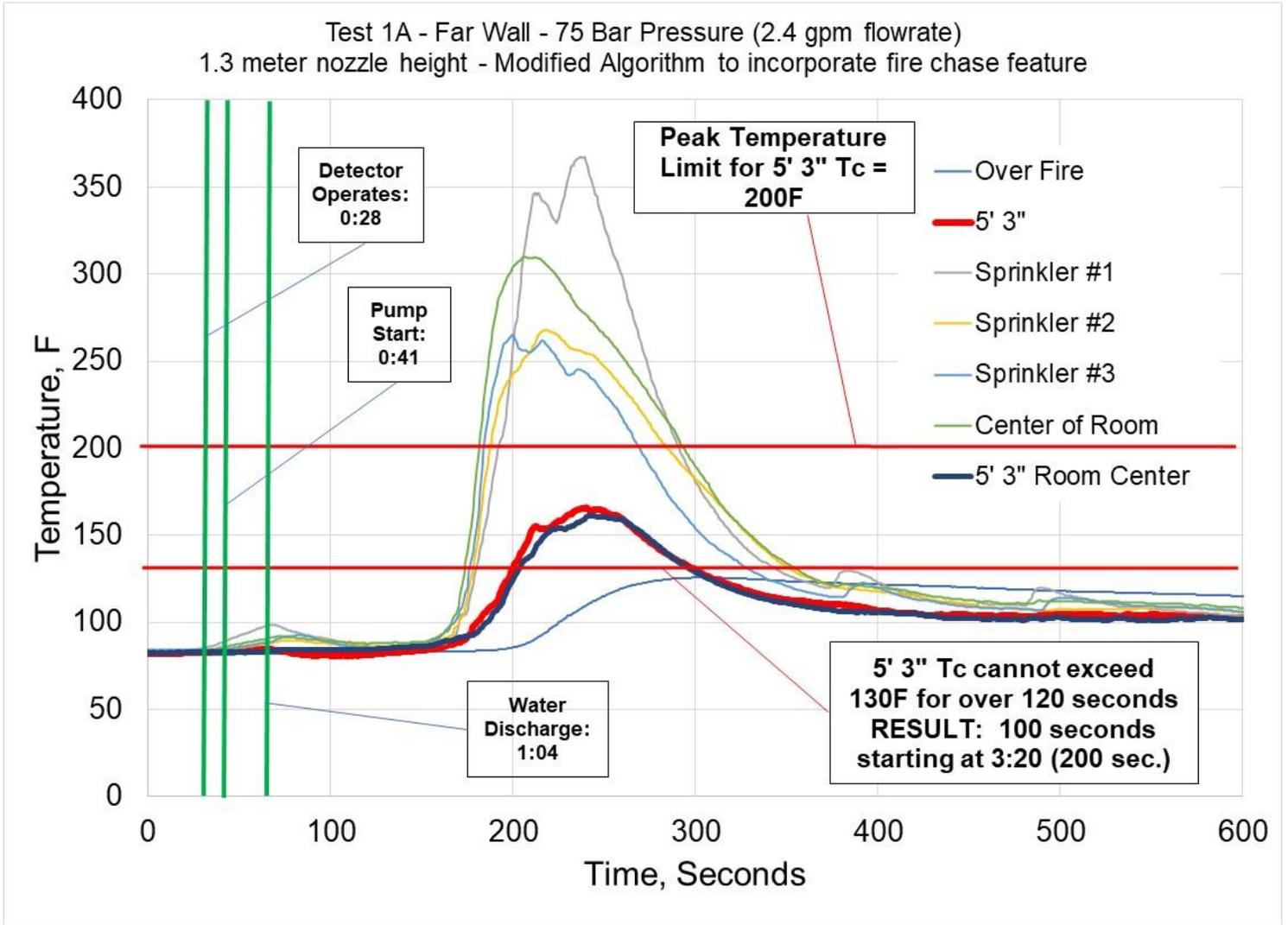
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**Residential Fire Test Data - Early Part of Test - Test 1**





Tested by: \_\_\_\_\_

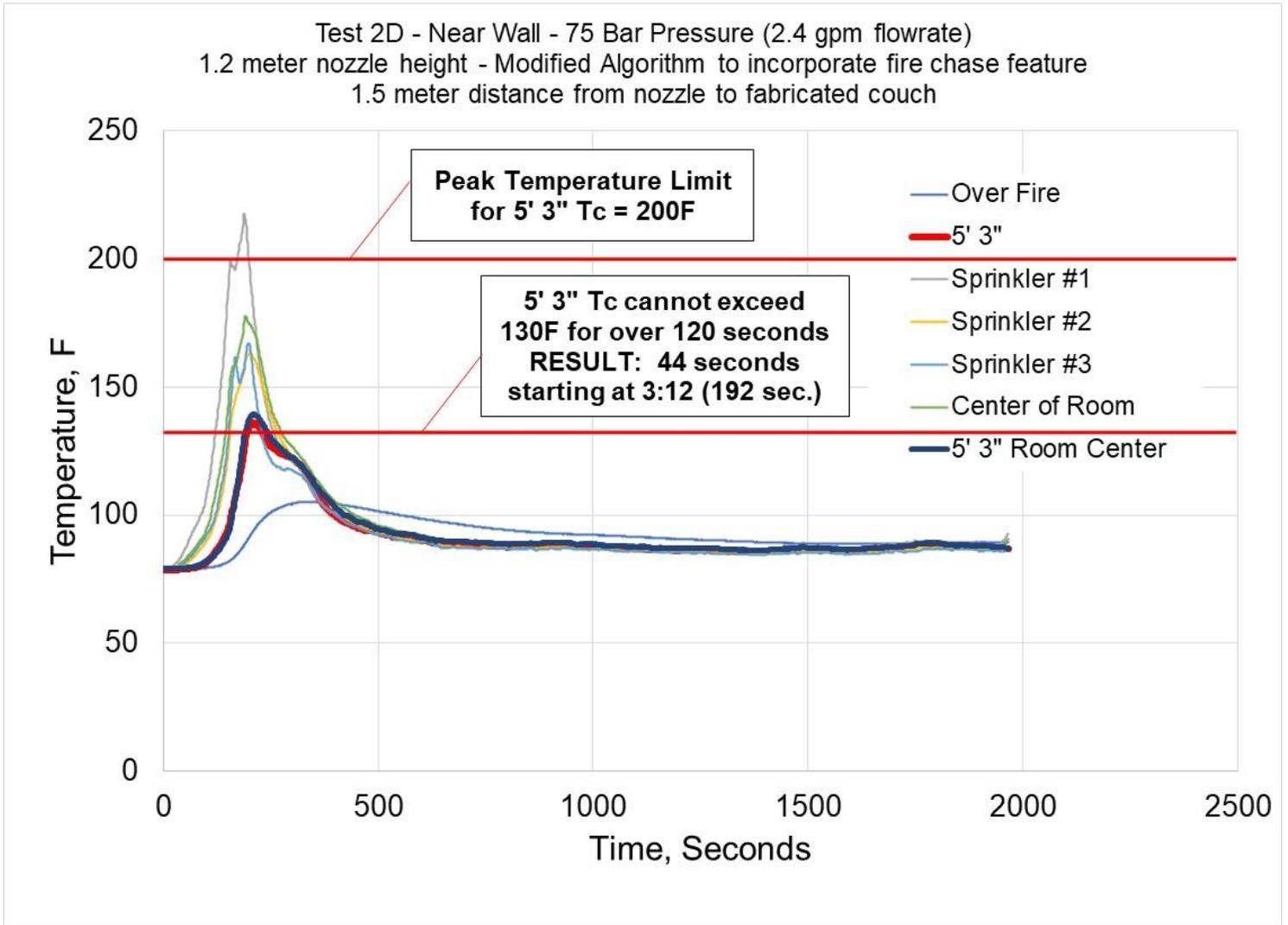
Date \_\_\_\_\_

Printed Name

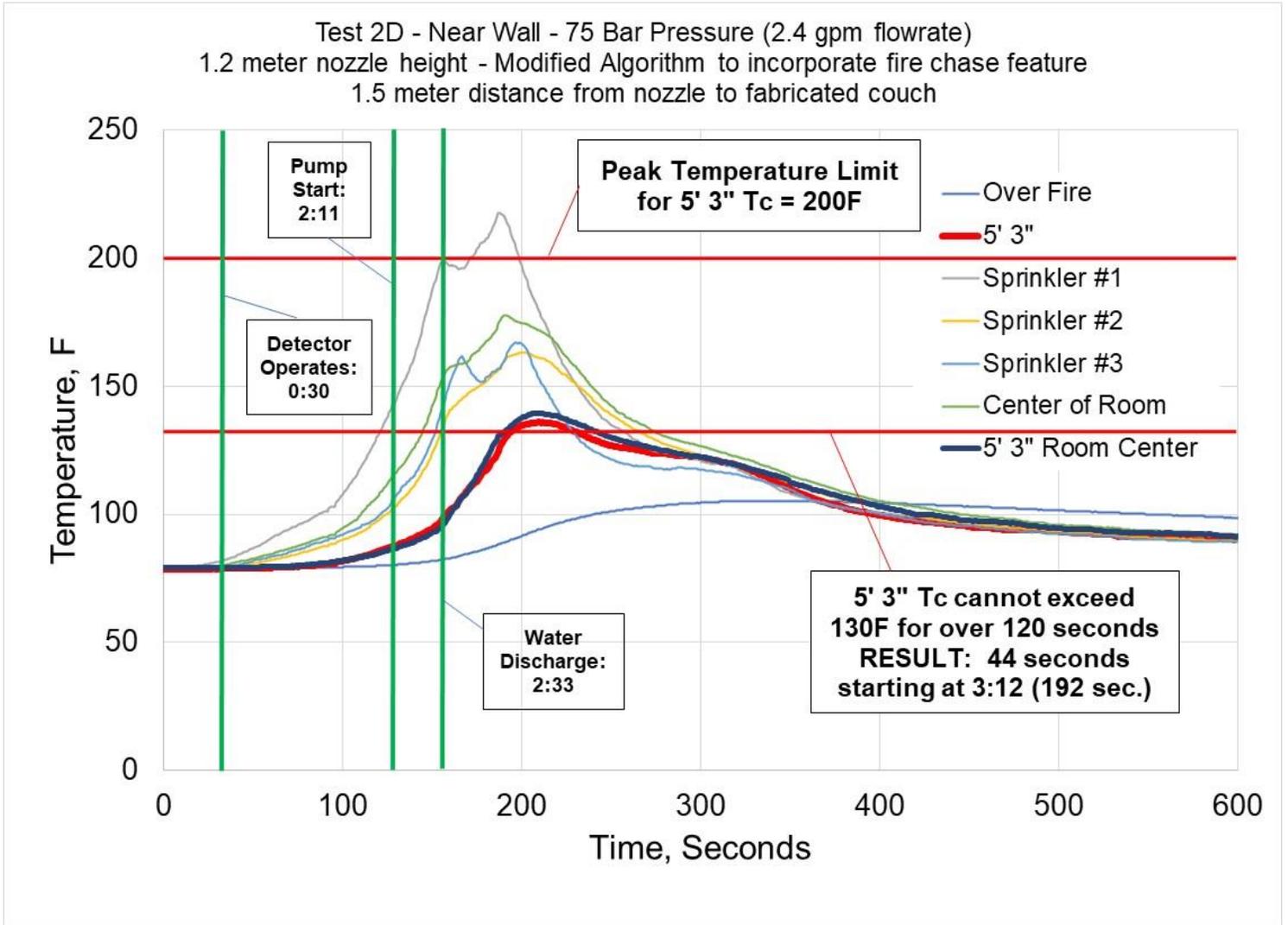
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TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room					
Test Number	2		Test Date	July 7, 2022	
Fire Test Code	07072201		Fuel Package	Fabricated Sofa with Plywood Wall Covering	
Tested per section	24	Of UL 2167B	Test Room	Building 2	
Test Configuration	Living Room		Room Size	14 ft. 8 in. by 26 ft. 3 in.	ft. by ft.
Operating Nozzle location with respect to fire	Near Wall		Algorithm Designation	v1.5_AH-0-da27e88	
Obstruction Detail	Not applicable (none)		Flowing Pressure	1,089	psig
Lateral position of nozzle in room	1.5 m away from the trailing edge of the couch		Nominal K-factor	0.072	gpm/psig <sup>0.5</sup>
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	47-1/4 (1.2 m)	in.
Event			Operation Sequence, Time; min:sec		
Smoke detector Operation Time (nozzle scanning start time)			0:30		
Pump Start			2:11		
Nozzle Discharge Start			2:33		
Test Duration			32:11		
			Trajectory Information		
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees			23		
Coanda Compensated Angle, degrees			31		
			Fire Angle	Coanda Angle	Pump On
Fire chase feature detail			23	31	2:11
					Pump Off
					32:11
Thermocouple ID#	Location		Maximum Ceiling Temperature, °F		
Tc #1	Above Fire Embedded in Ceiling Tile		105		
Tc #2	5 ft. 3 in. above test room floor near fuel package		136		
Tc #3	3 inches below Ceiling Near "First Sprinkler"		218		
Tc #4	3 inches below Ceiling Near "Second Sprinkler"		163		
Tc #5	3 inches below Ceiling Near "Doorway Location"		167		
Tc #6	3 inches below Ceiling - Center of Room		178		
Tc #7	5 ft. 3 in. above test room floor (Centered on Room)		Not taken		
Thermocouple Location (ID#)			Temperature Criteria	Results	
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)			Cannot exceed 500°F	A	
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)			Cannot exceed 200°F	A	
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)			Cannot exceed 600°F	A	
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)			Cannot exceed 600°F	A	
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)			Cannot exceed 200°F	A	
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F			Cannot exceed 130 °F for 120 seconds	A (44 seconds starting at 3:12)	
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F			Cannot exceed 130 °F for 120 seconds	Not taken	
A - Acceptable B - Unacceptable N/A - Not Applicable					
Comments:					

**Residential Fire Test Data - Full Test - Test 2**



**Residential Fire Test Data - Early Part of Test - Test 2**



Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

**Residential Fire Mass List - Test 3**

<b>Residential Fire Test Mass List</b>						
<b>Test Number</b>	3					
<b>Test Date</b>	July 5, 2022					
	<b>Component Description</b>	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	<b>Volume Density</b>
		pounds	inches	inches	inches	pounds/ cubic foot
	<b>Requirement:</b>	5.5 - 7.1				
	Wood Crib	6.95	12	12	6	
	<b>Requirement:</b>	1.7 - 1.9				
		<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	
		grams	inches	inches	inches	
	Cushion #1	1351	30	32	3	1.79
	Cushion #2	1354	30	32	3	1.79



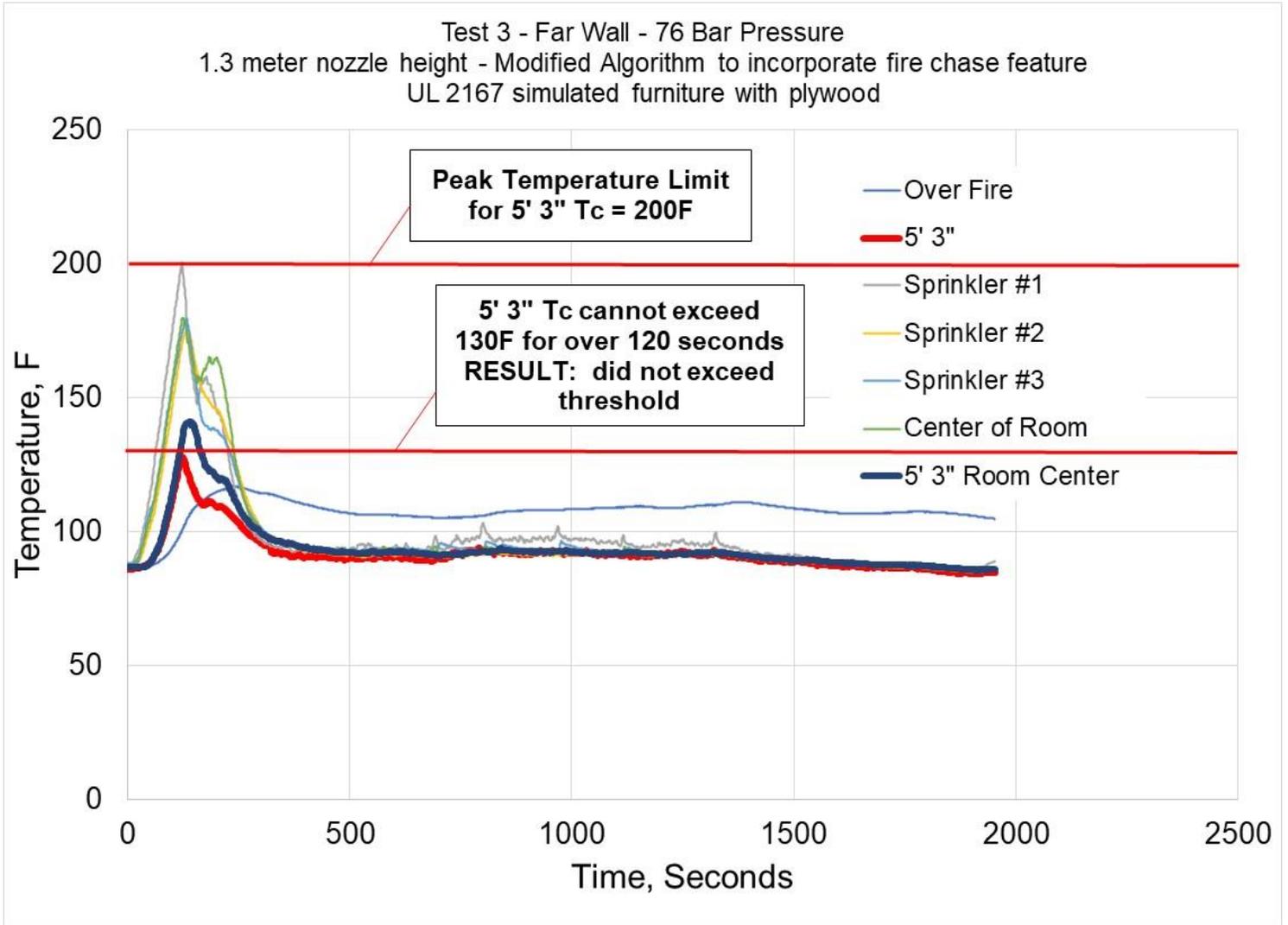
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Date \_\_\_\_\_

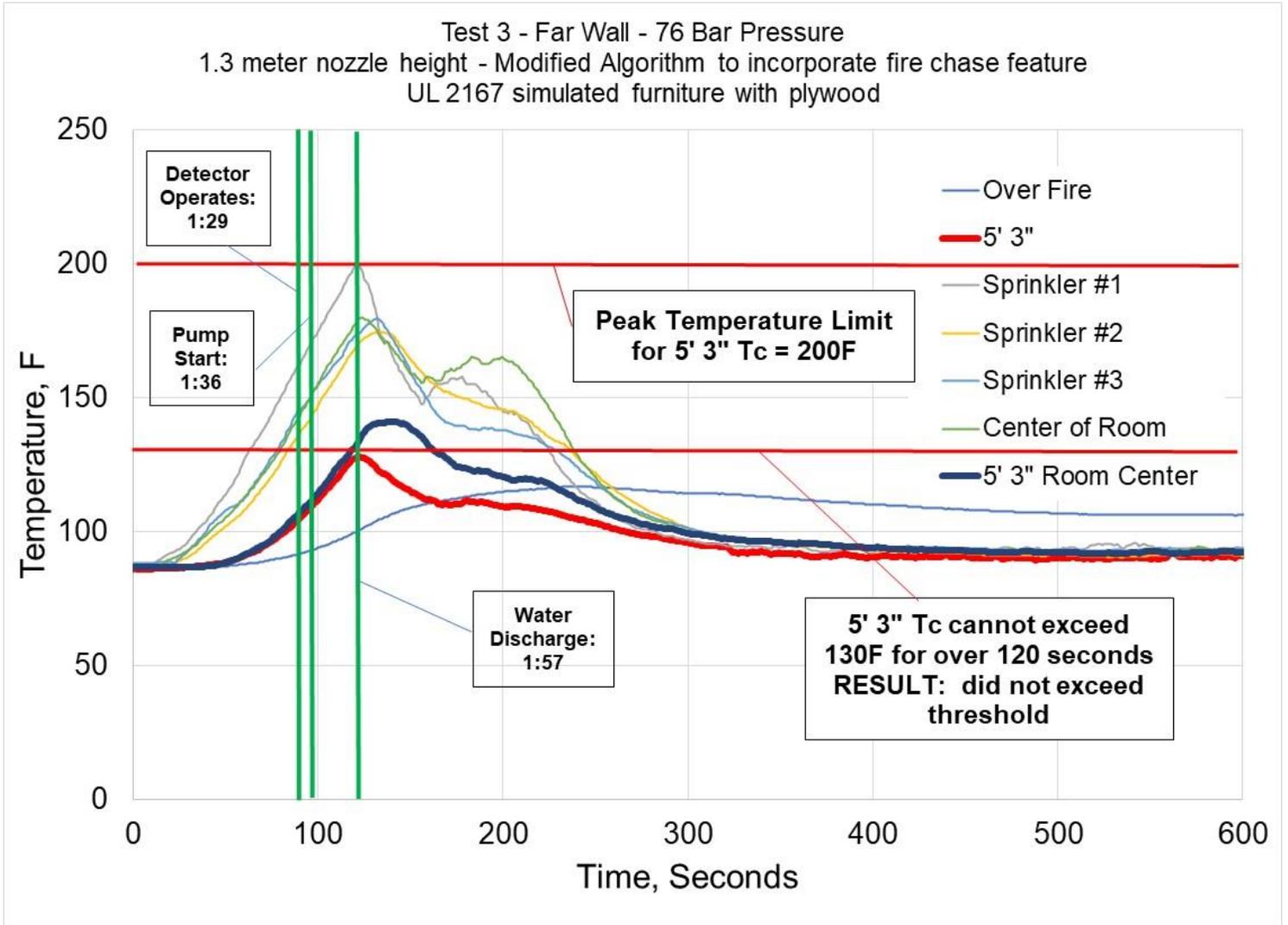
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**Residential Fire Test Data - Full Test - Test 3**



Residential Fire Test Data - Early Part of Test - Test 3



Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

**Residential Fire Mass List - Test 4**

<b>Residential Fire Test Mass List</b>						
<b>Test Number</b>	4					
<b>Test Date</b>	July 6, 2022					
	<b>Component Description</b>	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	<b>Volume Density</b>
		pounds	inches	inches	inches	pounds/ cubic foot
	<b>Requirement:</b>	5.5 - 7.1				
	Wood Crib	6.95	12	12	6	
	<b>Requirement:</b>					1.7 - 1.9
		<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	
		grams	inches	inches	inches	
	Cushion #1	1347	30	32	3	1.78
	Cushion #2	1348	30	32	3	1.78

Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

<b>TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room</b>					
Test Number	4		Test Date	July 6, 2022	
Fire Test Code	07062201		Fuel Package	UL 2167 simulated furniture with plywood	
Tested per section	24	Of UL 2167B	Test Room	Building 2	
Test Configuration	Living Room		Room Size	14 ft. 8 in. by 26 ft. 3 in.	ft. by ft.
Operating Nozzle location with respect to fire	Near Wall		Algorithm Designation	v1.5_AH-0-da27e88	
Obstruction Detail	Not applicable (none)		Flowing Pressure	1,089	psig
Lateral position of nozzle in room	Centered on Near Wall		Nominal K-factor	0.072	gpm/psig <sup>0.5</sup>
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	47-1/4 (1.2 m)	in.
<b>Event</b>					
			<b>Operation Sequence, Time; min:sec</b>		
Smoke detector Operation Time (nozzle scanning start time)			1:37		
Pump Start			1:46		
Nozzle Discharge Start			2:05		
Test Duration			31:47		
<b>Trajectory Information</b>					
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees			26		
Coanda Compensated Angle, degrees			32		
			<b>Fire Angle</b>	<b>Coanda Angle</b>	<b>Pump On</b>
Fire chase feature detail			26	32	1:46
					<b>Pump Off</b>
					31:47
<b>Thermocouple ID#</b>					
<b>Location</b>			<b>Maximum Ceiling Temperature, °F</b>		
Tc #1			Above Fire Embedded in Ceiling Tile		
Tc #2			5 ft. 3 in. above test room floor near fuel package		
Tc #3			3 inches below Ceiling Near "First Sprinkler"		
Tc #4			3 inches below Ceiling Near "Second Sprinkler"		
Tc #5			3 inches below Ceiling Near "Doorway Location"		
Tc #6			3 inches below Ceiling - Center of Room		
Tc #7			5 ft. 3 in. above test room floor (Centered on Room)		
			<b>Not taken</b>		
<b>Thermocouple Location (ID#)</b>					
<b>Temperature Criteria</b>			<b>Results</b>		
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)			Cannot exceed 500°F		
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)			Cannot exceed 200°F		
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)			Cannot exceed 600°F		
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)			Cannot exceed 600°F		
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)			Cannot exceed 200°F		
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F			Cannot exceed 130 °F for 120 seconds		
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F			Cannot exceed 130 °F for 120 seconds		
			<b>A</b> (57 seconds starting at 2:18)		
			<b>Not taken</b>		
A - Acceptable B - Unacceptable N/A - Not Applicable					
Comments:					

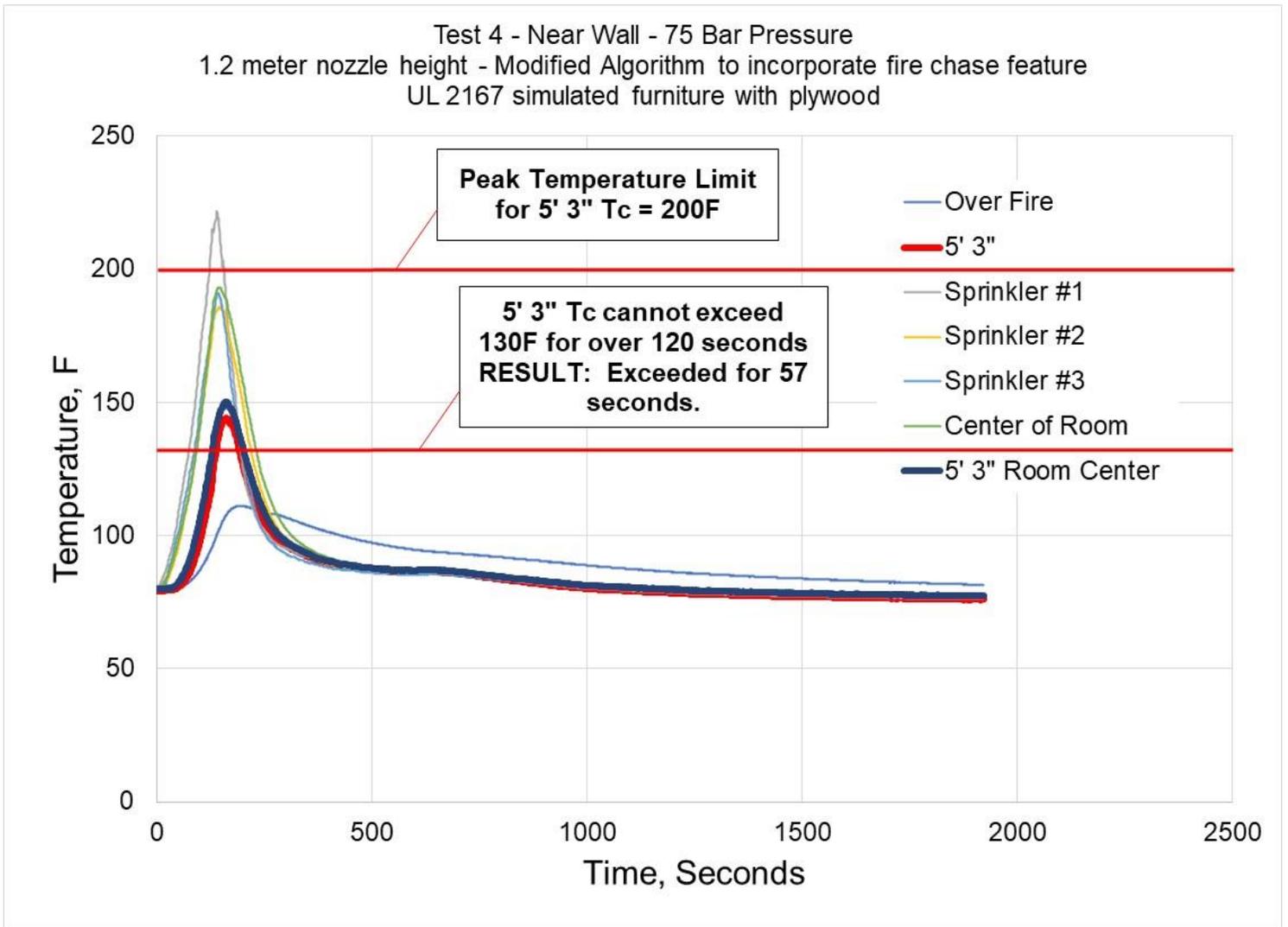
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Date \_\_\_\_\_

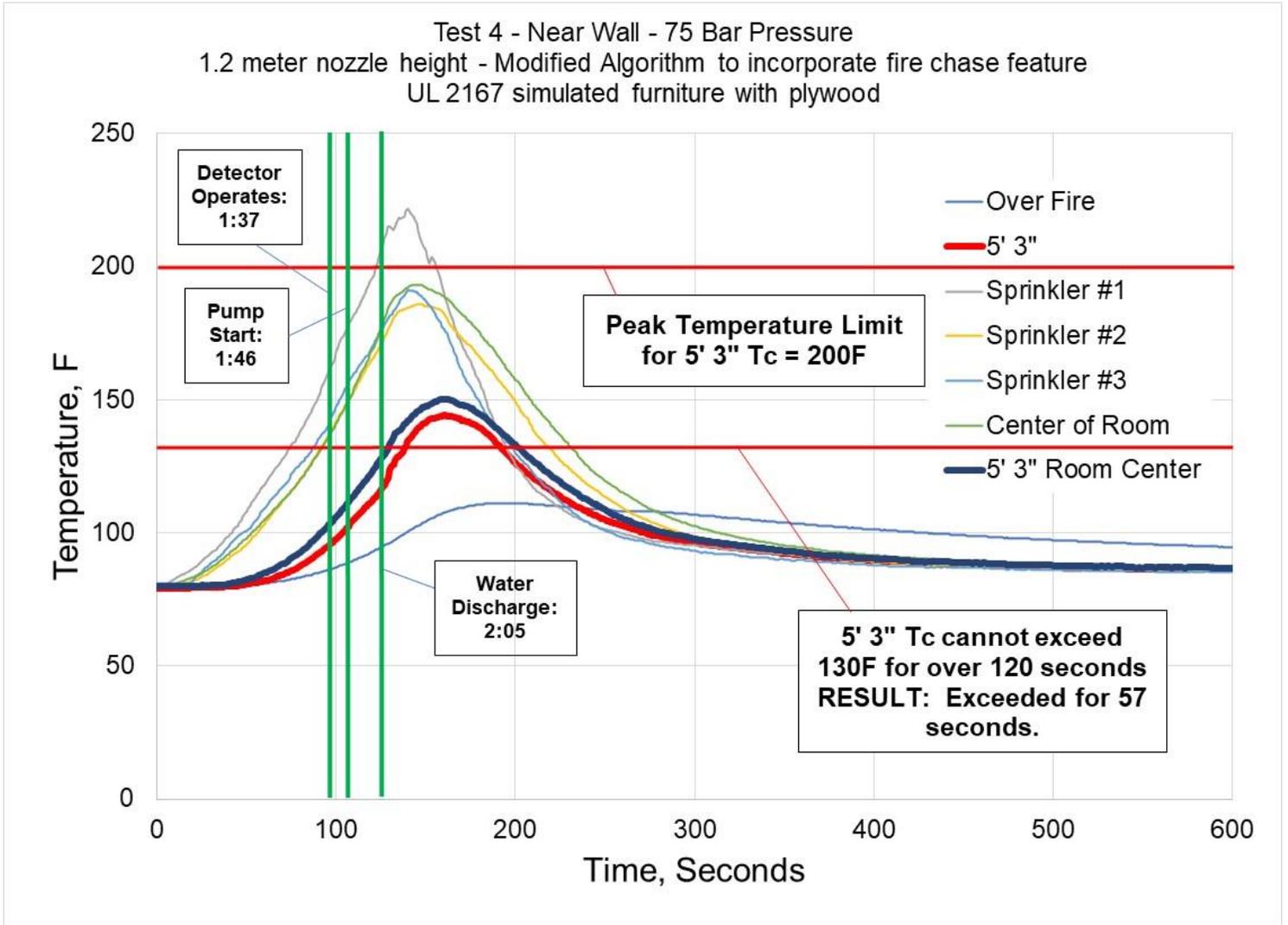
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**Residential Fire Test Data - Full Test - Test 4**



**Residential Fire Test Data - Early Part of Test - Test 4**



Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

**Residential Fire Mass List - Test 5**

Residential Fire Test Mass List							
<b>Test Number</b>	5	(5A)					
<b>Test Date</b>	July 15, 2022						
	<b>Component Description</b>	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	<b>Volume Density</b>	<b>Area Density</b>
		pounds	inches	inches	inches	pounds/ cubic foot	pounds/ square foot
	<b>Requirement:</b>	5.5 - 7.1					
	Wood Crib	6.75	12	12	6		
	<b>Requirement:</b>					1.7 - 1.9	0.046 - 0.053
		<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>		
		grams	inches	inches	inches		
	Cushion #1	1302	30	32	3	1.72	
	Cushion #2	1303	30	32	3	1.72	
		<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>		
		pounds	inches	inches	inches		
	Drapes - Panel #1	1.70	88	60	n/a		0.046
	Drapes - Panel #2	1.70	88	60	n/a		0.046
	Drapes - Panel #3	1.70	88	60	n/a		0.046
	Drapes - Panel #4	1.70	88	60	n/a		0.046

Tested by: \_\_\_\_\_

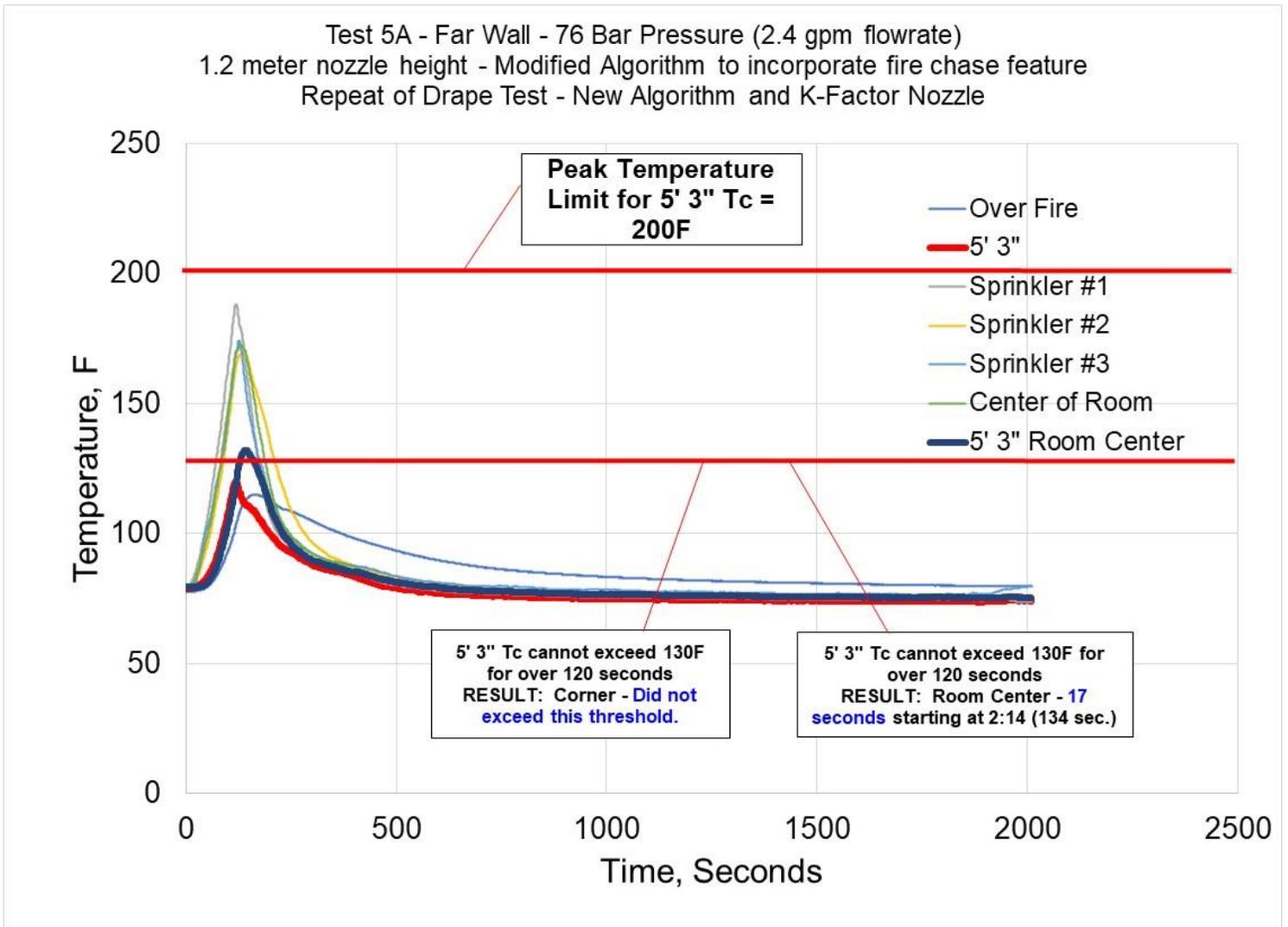
Date \_\_\_\_\_

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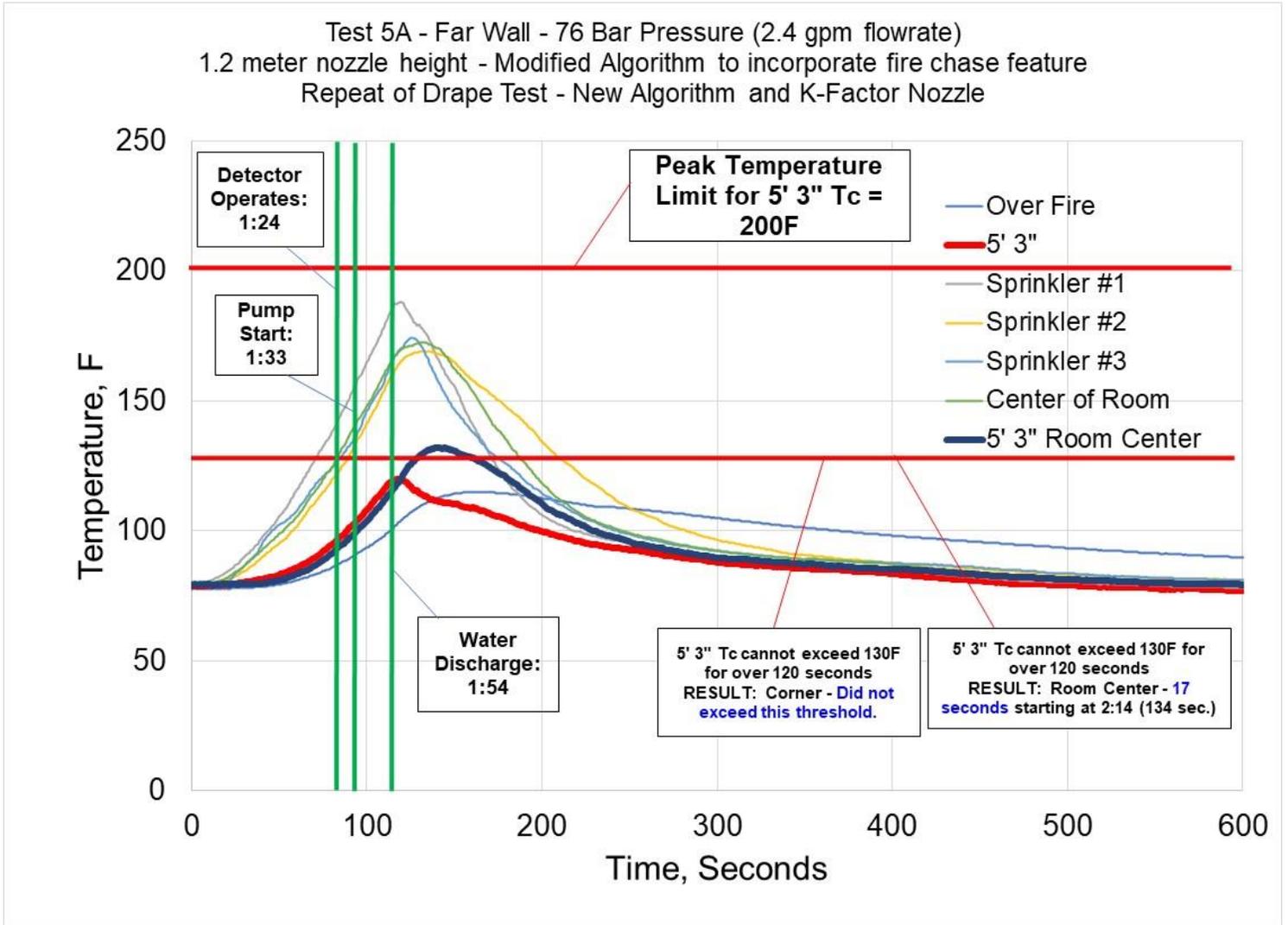
Signature

TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room					
Test Number	5		Test Date	July 15, 2022	
Fire Test Code	07152201		Fuel Package	UL 2167 simulated furniture with drapes	
Tested per section	24	Of UL 2167B	Test Room	Building 2	
Test Configuration	Living Room		Room Size	14 ft. 8 in. by 26 ft. 3 in.	ft. by ft.
Operating Nozzle location with respect to fire	Far Wall		Algorithm Designation	v1.5_AH-0-da27e88	
Obstruction Detail	Not applicable (none)		Flowing Pressure	1,100	psig
Lateral position of nozzle in room	Centered on Far Wall		Nominal K-factor	0.072	gpm/psig <sup>0.5</sup>
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	47-1/4 (1.2 m)	in.
<b>Event</b>			<b>Operation Sequence, Time; min:sec</b>		
Smoke detector Operation Time (nozzle scanning start time)			1:24		
Pump Start			1:33		
Nozzle Discharge Start			1:54		
Test Duration			31:32		
			<b>Trajectory Information</b>		
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees			133		
Coanda Compensated Angle, degrees			133		
			<b>Fire Angle</b>	<b>Coanda Angle</b>	<b>Pump On</b>
Fire chase feature detail			133	133	1:33
			<b>Pump Off</b>	31:32	
<b>Thermocouple ID#</b>	<b>Location</b>		<b>Maximum Ceiling Temperature, °F</b>		
Tc #1	Above Fire Embedded in Ceiling Tile		115		
Tc #2	5 ft. 3 in. above test room floor near fuel package		120		
Tc #3	3 inches below Ceiling Near "First Sprinkler"		188		
Tc #4	3 inches below Ceiling Near "Second Sprinkler"		169		
Tc #5	3 inches below Ceiling Near "Doorway Location"		174		
Tc #6	3 inches below Ceiling - Center of Room		172		
Tc #7	5 ft. 3 in. above test room floor (Centered on Room)		132		
<b>Thermocouple Location (ID#)</b>			<b>Temperature Criteria</b>		<b>Results</b>
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)			Cannot exceed 500°F		A
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)			Cannot exceed 200°F		A
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)			Cannot exceed 600°F		A
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)			Cannot exceed 600°F		A
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)			Cannot exceed 200°F		A
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F			Cannot exceed 130 °F for 120 seconds		A (did not exceed threshold)
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F			Cannot exceed 130 °F for 120 seconds		A (17 seconds starting at 2:14)
A - Acceptable B - Unacceptable N/A - Not Applicable					
Comments:					

**Residential Fire Test Data - Full Test - Test 5**



Residential Fire Test Data - Early Part of Test - Test 5



Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

**Residential Fire Mass List - Test 6**

<b>Residential Fire Test Mass List</b>							
<b>Test Number</b>	6	(6A)					
<b>Test Date</b>	July 14, 2022						
	<b>Component Description</b>	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	<b>Volume Density</b>	<b>Area Density</b>
		pounds	inches	inches	inches	pounds/ cubic foot	pounds/ square foot
	<b>Requirement:</b>	5.5 - 7.1					
	Wood Crib	6.90	12	12	6		
	<b>Requirement:</b>					1.7 - 1.9	0.046 - 0.053
		<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>		
		grams	inches	inches	inches		
	Cushion #1	1298	30	32	3	1.72	
	Cushion #2	1299	30	32	3	1.72	
		<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>		
		pounds	inches	inches	inches		
	Drapes - Panel #1	1.70	88	60	n/a		0.046
	Drapes - Panel #2	1.70	88	60	n/a		0.046
	Drapes - Panel #3	1.70	88	60	n/a		0.046
	Drapes - Panel #4	1.70	88	60	n/a		0.046

Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room					
Test Number	6		Test Date	July 14, 2022	
Fire Test Code	07152201		Fuel Package	UL 2167 simulated furniture with drapes	
Tested per section	24	Of UL 2167B	Test Room	Building 2	
Test Configuration	Living Room		Room Size	14 ft. 8 in. by 26 ft. 3 in.	ft. by ft.
Operating Nozzle location with respect to fire	Near Wall		Algorithm Designation	v1.5_AH-0-da27e88	
Obstruction Detail	Not applicable (none)		Flowing Pressure	1,100	psig
Lateral position of nozzle in room	Centered on Far Wall		Nominal K-factor	0.072	gpm/psig <sup>0.5</sup>
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	47-1/4 (1.2 m)	in.
<b>Event</b>			<b>Operation Sequence, Time; min:sec</b>		
Smoke detector Operation Time (nozzle scanning start time)			1:26		
Pump Start			1:36		
Nozzle Discharge Start			1:54		
Test Duration			31:36		
			<b>Trajectory Information</b>		
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees			18		
Coanda Compensated Angle, degrees			31		
			<b>Fire Angle</b>	<b>Coanda Angle</b>	<b>Pump On</b>
Fire chase feature detail			18	31	1:36
			<b>Pump Off</b>	31:36	
<b>Thermocouple ID#</b>	<b>Location</b>		<b>Maximum Ceiling Temperature, °F</b>		
Tc #1	Above Fire Embedded in Ceiling Tile		118		
Tc #2	5 ft. 3 in. above test room floor near fuel package		125		
Tc #3	3 inches below Ceiling Near "First Sprinkler"		198		
Tc #4	3 inches below Ceiling Near "Second Sprinkler"		172		
Tc #5	3 inches below Ceiling Near "Doorway Location"		180		
Tc #6	3 inches below Ceiling - Center of Room		178		
Tc #7	5 ft. 3 in. above test room floor (Centered on Room)		132		
<b>Thermocouple Location (ID#)</b>			<b>Temperature Criteria</b>		<b>Results</b>
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)			Cannot exceed 500°F		A
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)			Cannot exceed 200°F		A
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)			Cannot exceed 600°F		A
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)			Cannot exceed 600°F		A
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)			Cannot exceed 200°F		A
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F			Cannot exceed 130 °F for 120 seconds		A (did not exceed threshold)
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F			Cannot exceed 130 °F for 120 seconds		A (15 seconds starting at 2:24)
A - Acceptable B - Unacceptable N/A - Not Applicable					
Comments:					

Tested by: \_\_\_\_\_

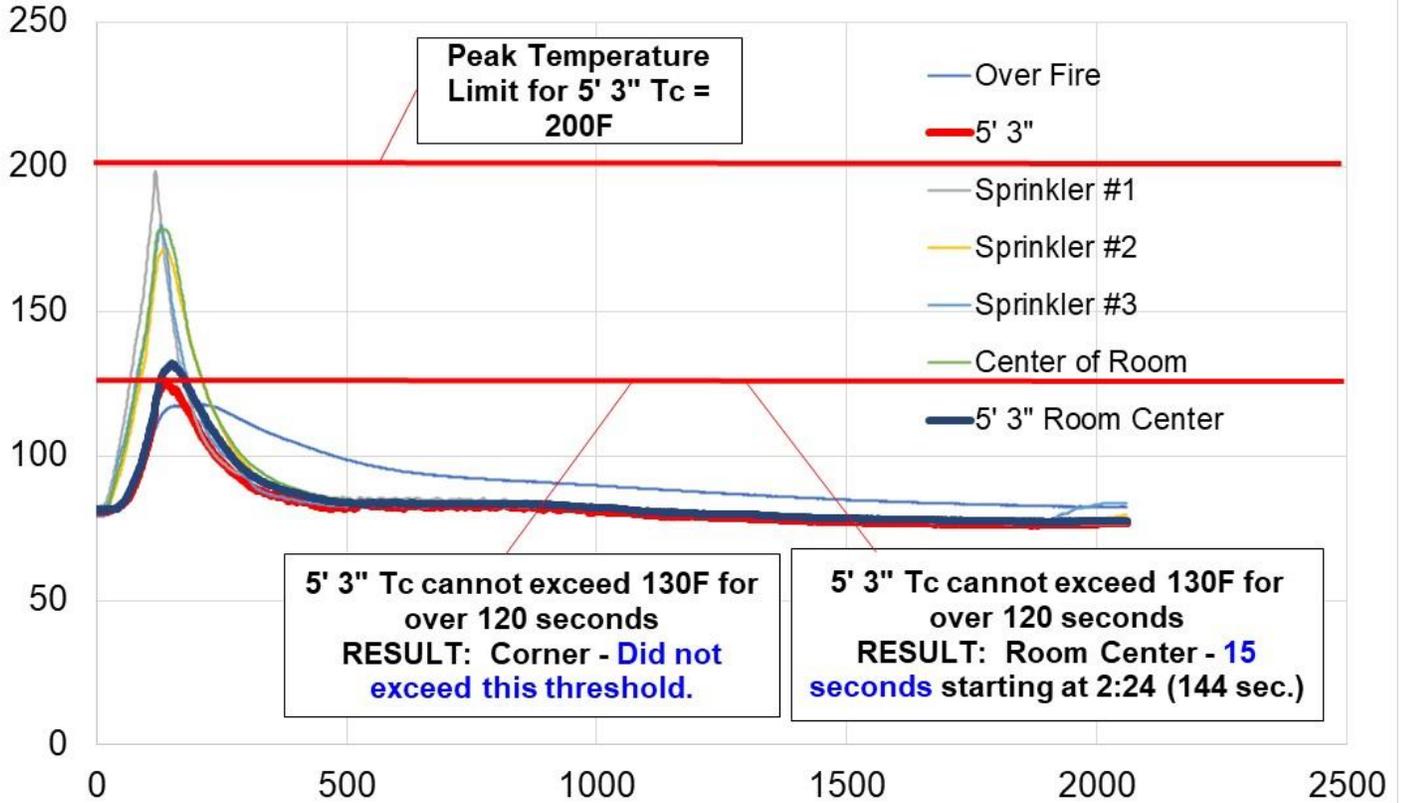
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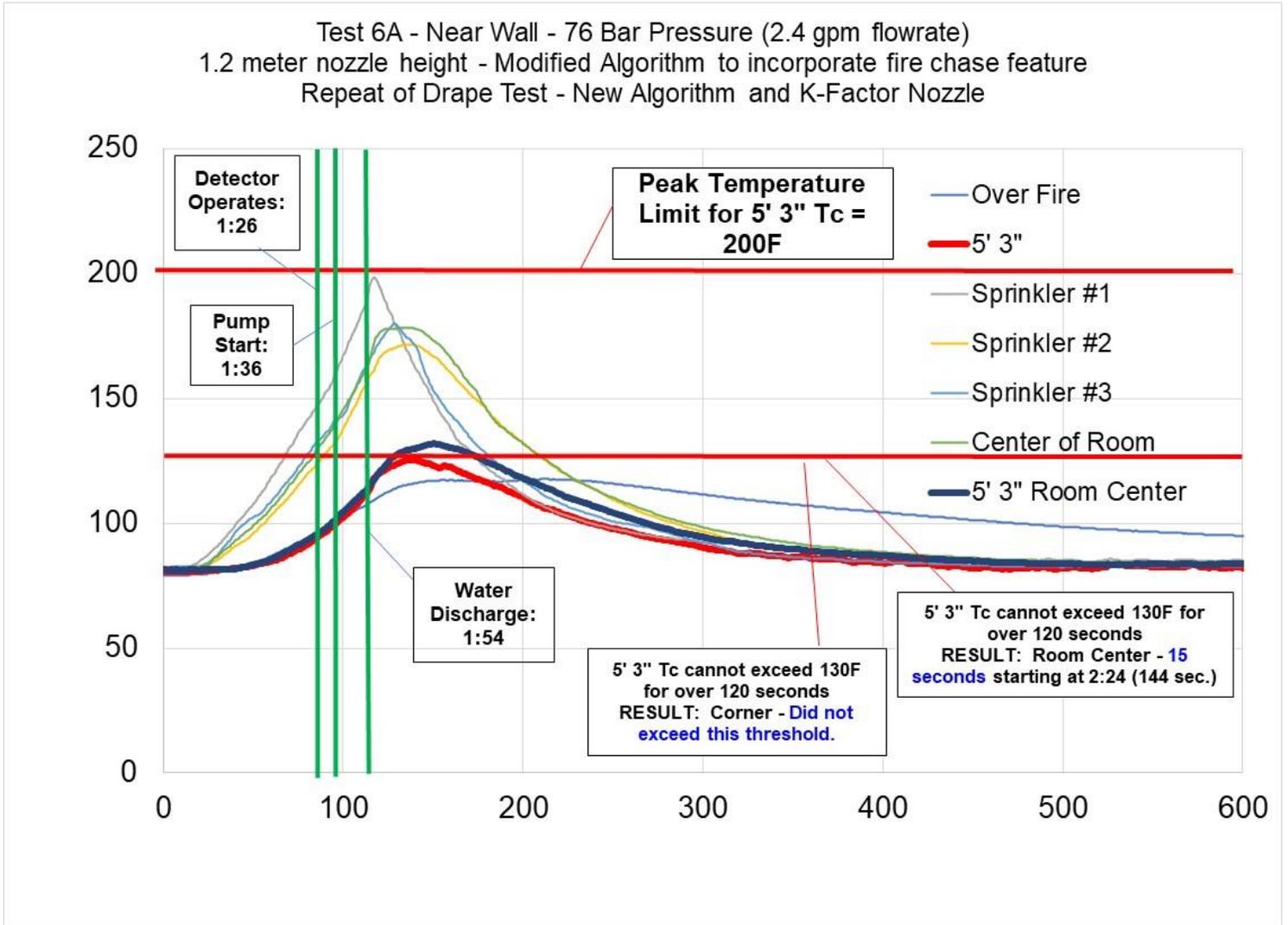
Signature

**Residential Fire Test Data - Full Test - Test 6**

Test 6A - Near Wall - 76 Bar Pressure (2.4 gpm flowrate)  
1.2 meter nozzle height - Modified Algorithm to incorporate fire chase feature  
Repeat of Drape Test - New Algorithm and K-Factor Nozzle



Residential Fire Test Data - Early Part of Test - Test 6



Project No. 4790418313

File EX27607

Page 45

Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

**Residential Fire Mass List - Test 7**

NOTE: Not needed - 450 ml of Canola oil used in a 10-1/2 inch diameter skillet (1-3/4 inch tall) for approximately 1/2 inch depth of oil.

Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

<b>TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room</b>					
Test Number	7		Test Date	July 19, 2022	
Fire Test Code	07192201		Fuel Package	Cooking Oil Fire (Canola Oil)	
Tested per section	24	Of UL 2167B	Test Room	Building 2	
Test Configuration	Kitchen		Room Size	14 ft. 8 in. by 26 ft. 3 in.	ft. by ft.
Operating Nozzle location with respect to fire	Far Wall		Algorithm Designation	v1.5_AH-0-da27e88	
Obstruction Detail	Not applicable (none)		Flowing Pressure	1,100	psig
Lateral position of nozzle in room	Centered on Far Wall		Nominal K-factor	0.072	gpm/psig <sup>0.5</sup>
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	47-1/4 (1.2 m)	in.
<b>Event</b>			<b>Operation Sequence, Time; min:sec</b>		
Smoke detector Operation Time (nozzle scanning start time)			12:50		
Pump Start			18:29		
Nozzle Discharge Start			18:50		
Test Duration			31:07 (flames extinguished at 22:35)		
			<b>Trajectory Information</b>		
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees			131		
Coanda Compensated Angle, degrees			131		
			<b>Fire Angle</b>	<b>Coanda Angle</b>	<b>Pump On</b>
Fire chase feature detail			131	131	18:29
					31:07 (manually turned pump off)
<b>Thermocouple ID#</b>	<b>Location</b>		<b>Maximum Ceiling Temperature, °F</b>		
Tc #1	Above Fire Embedded in Ceiling Tile		104		
Tc #2	5 ft. 3 in. above test room floor near fuel package		94		
Tc #3	3 inches below Ceiling Near "First Sprinkler"		103		
Tc #4	3 inches below Ceiling Near "Second Sprinkler"		100		
Tc #5	3 inches below Ceiling Near "Doorway Location"		103		
Tc #6	3 inches below Ceiling - Center of Room		100		
Tc #7	5 ft. 3 in. above test room floor (Centered on Room)		93		
<b>Thermocouple Location (ID#)</b>			<b>Temperature Criteria</b>		<b>Results</b>
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)			Cannot exceed 500°F		A
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)			Cannot exceed 200°F		A
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)			Cannot exceed 600°F		A
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)			Cannot exceed 600°F		A
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)			Cannot exceed 200°F		A
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F			Cannot exceed 130 °F for 120 seconds		A (did not exceed threshold)
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F			Cannot exceed 130 °F for 120 seconds		A (did not exceed threshold)
A - Acceptable B - Unacceptable N/A - Not Applicable					
Comments:					

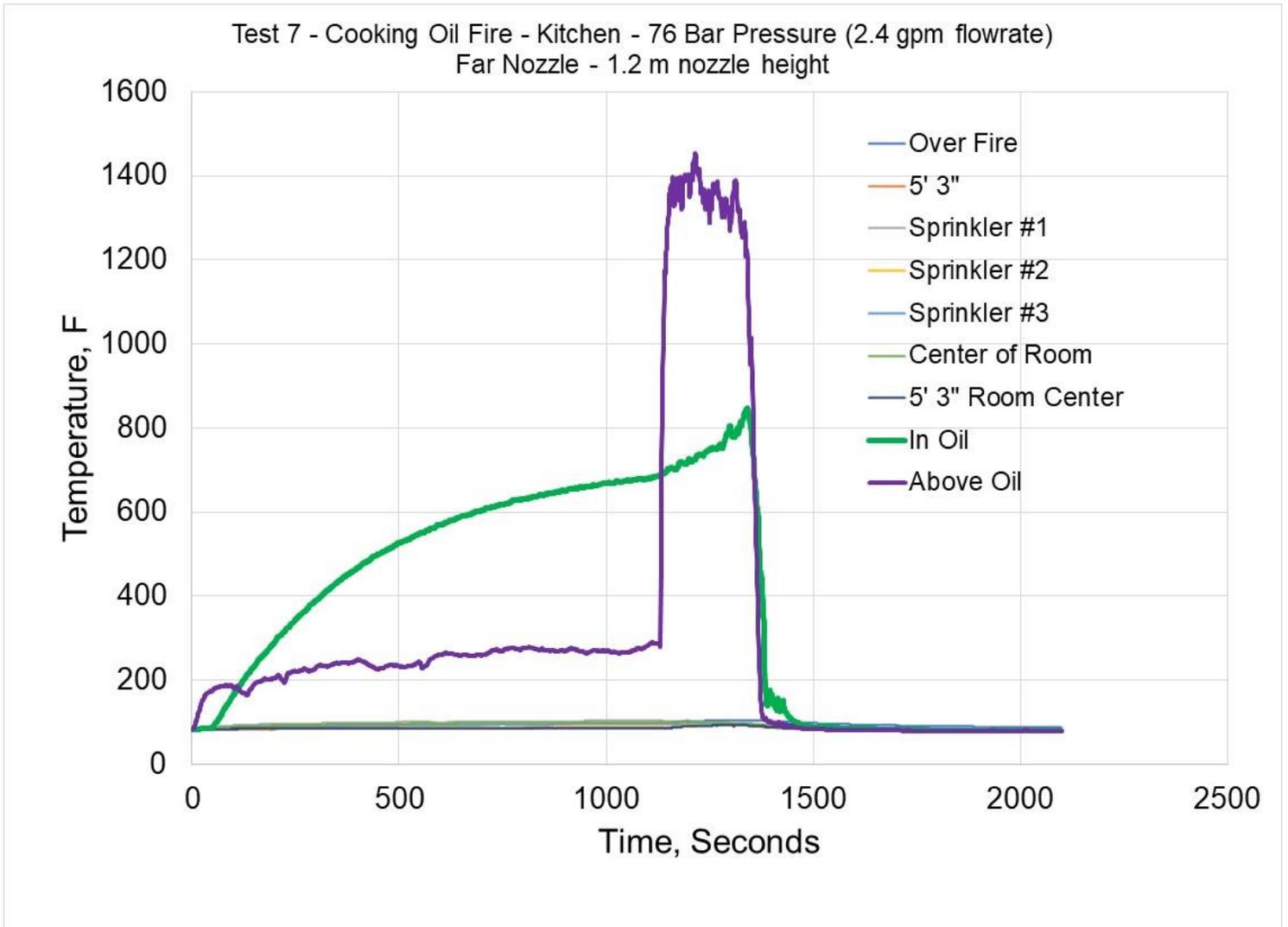
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Date \_\_\_\_\_

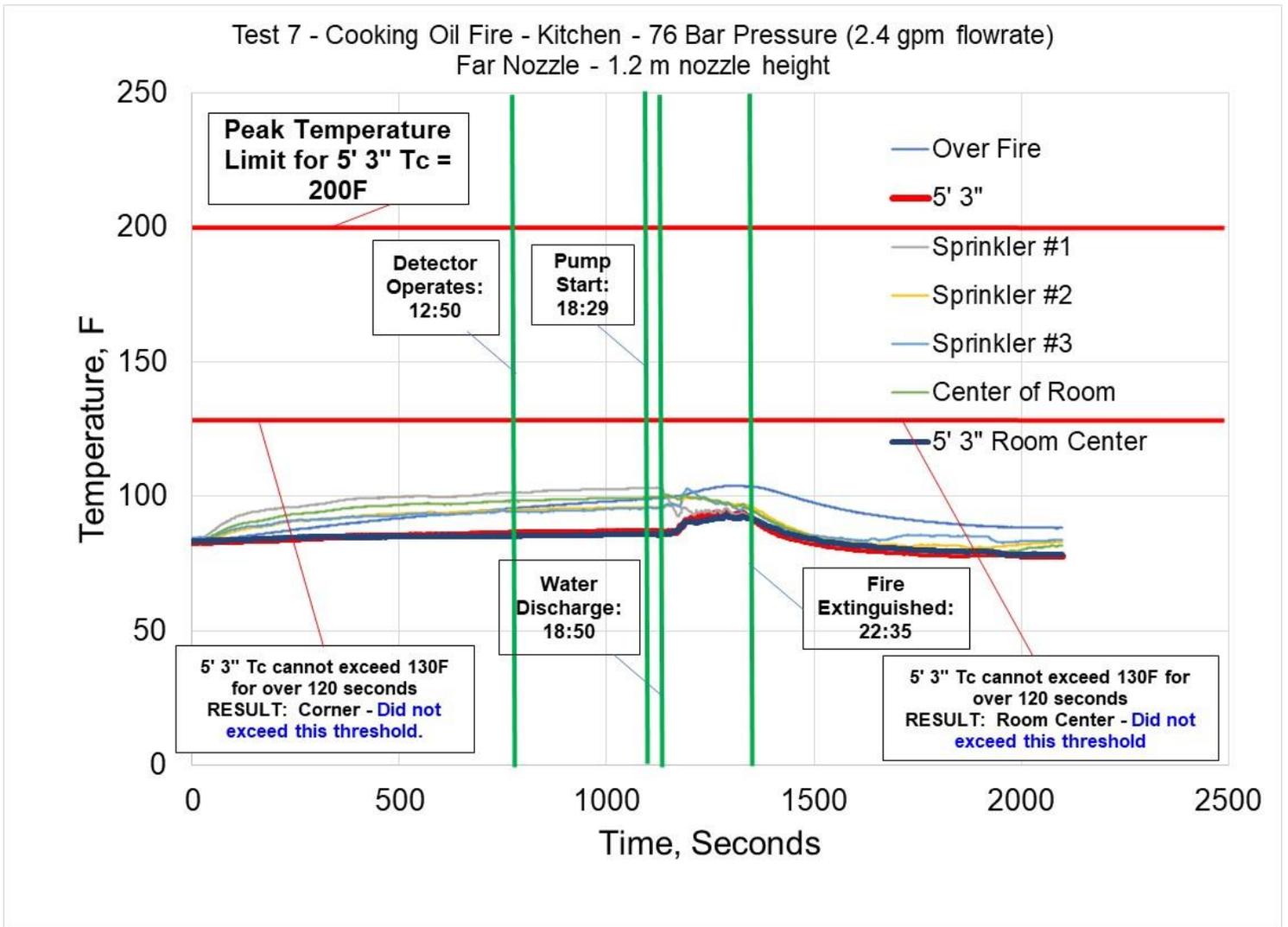
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**Residential Fire Test Data - Full Test - Test 7**



Residential Fire Test Data - All of Test Minus Oil Data - Test 7



Project No. 4790418313

File EX27607

Page 49

Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

**Residential Fire Mass List - Test 7A**

NOTE: Not needed - 450 ml of Canola oil used in a 10-1/2 inch diameter skillet (1-3/4 inch tall) for approximately 1/2 inch depth of oil.

Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room					
Test Number	7A		Test Date	July 19, 2022	
Fire Test Code	07192202		Fuel Package	Cooking Oil Fire (Canola Oil)	
Tested per section	24	Of UL 2167B	Test Room	Building 2	
Test Configuration	Kitchen		Room Size	14 ft. 8 in. by 26 ft. 3 in. ft. by ft.	
Operating Nozzle location with respect to fire	Near Wall		Algorithm Designation	v1.5_AH-0-da27e88	
Obstruction Detail	Not applicable (none)		Flowing Pressure	1,100 psig	
Lateral position of nozzle in room	Centered on Near Wall (leading edge of cooking island - 1.5 away from nozzle)		Nominal K-factor	0.072 gpm/psig <sup>0.5</sup>	
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	51-1/8 (1.3 m) in.	
Event		Operation Sequence, Time; min:sec			
Smoke detector Operation Time (nozzle scanning start time)		13:39			
Pump Start		15:09			
Nozzle Discharge Start		15:30			
Test Duration		35:53 (flames extinguished at 17:00)			
		Trajectory Information			
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees		131			
Coanda Compensated Angle, degrees		131			
		Fire Angle	Coanda Angle	Pump On	Pump Off
Fire chase feature detail		17	30	15:09	35:53 (manually turned pump off)
Thermocouple ID#	Location			Maximum Ceiling Temperature, °F	
Tc #1	Above Fire Embedded in Ceiling Tile			113	
Tc #2	5 ft. 3 in. above test room floor near fuel package			109	
Tc #3	3 inches below Ceiling Near "First Sprinkler"			152	
Tc #4	3 inches below Ceiling Near "Second Sprinkler"			139	
Tc #5	3 inches below Ceiling Near "Doorway Location"			156	
Tc #6	3 inches below Ceiling - Center of Room			152	
Tc #7	5 ft. 3 in. above test room floor (Centered on Room)			109	
Thermocouple Location (ID#)	Temperature Criteria		Results		
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)	Cannot exceed 500°F		A		
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)	Cannot exceed 200°F		A		
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)	Cannot exceed 600°F		A		
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)	Cannot exceed 600°F		A		
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)	Cannot exceed 200°F		A		
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F	Cannot exceed 130 °F for 120 seconds		A (did not exceed threshold)		
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F	Cannot exceed 130 °F for 120 seconds		A (did not exceed threshold)		
A - Acceptable B - Unacceptable N/A - Not Applicable					

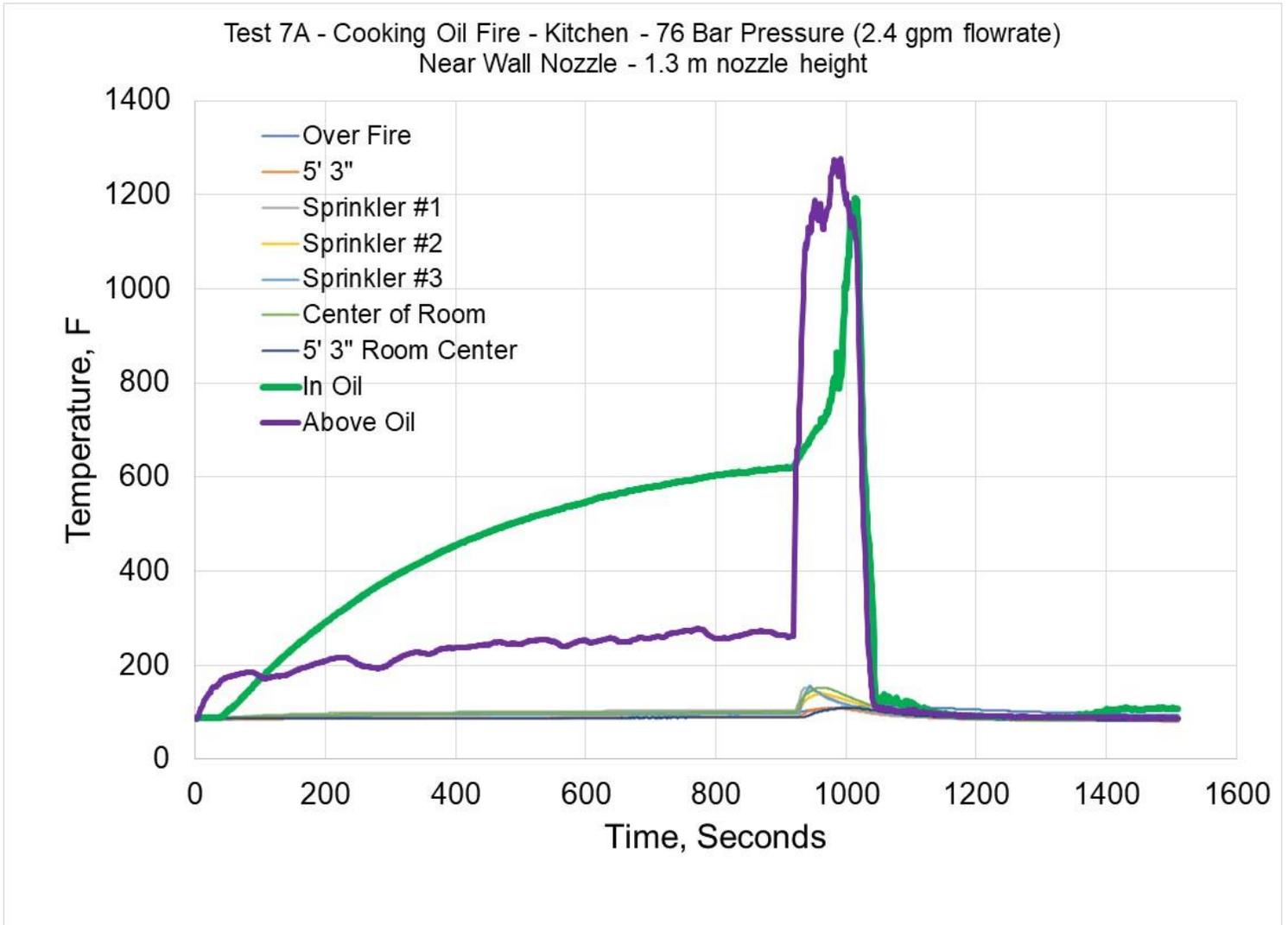
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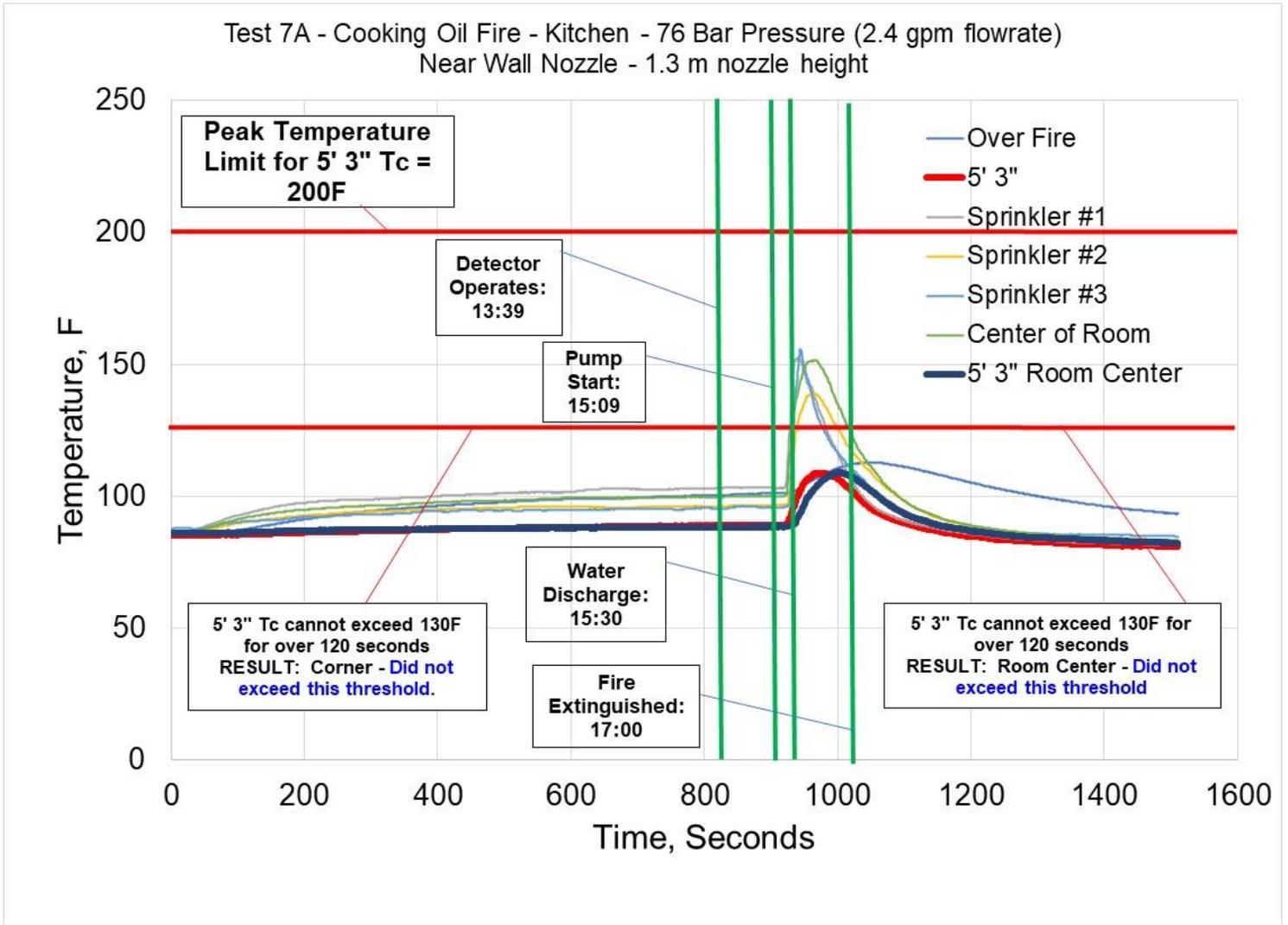
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Date \_\_\_\_\_

**Residential Fire Test Data - Full Test - Test 7A**



Residential Fire Test Data - All of Test Minus Oil Data - Test 7A



Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

**Residential Fire Mass List - Test 8**

<b>Residential Fire Test Mass List</b>							
<b>Test Number</b>	8						
<b>Test Date</b>	July 8, 2022						
	<b>Component Description</b>	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	<b>Volume Density</b>	<b>Area Density</b>
		<b>pounds</b>	<b>inches</b>	<b>inches</b>	<b>inches</b>	<b>pounds/ cubic foot</b>	<b>pounds/ square foot</b>
				<b>Requirement:</b>		1.6 - 1.9	0.046 - 0.053
	Back Cushion	14.25	71.5	24.25	8	1.78	
	Seat Cushion	15.45	71.75	26	8	1.79	
	Back Cushion fabric	2.20	164	42	n/a		0.046
	Seat Cushion fabric	2.25	164	42	n/a		0.047
	Stuffed Pillow 1 - Final	5.85	32	21	12.5		
	Stuffed Pillow 2 - Final	5.85	32	21	13		
	Stuffed Pillow 3 - Final	5.90	31.5	22	14		
		<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>		
		<b>grams</b>	<b>inches</b>	<b>inches</b>	<b>inches</b>		
	Armrest Foam 1	175.2	18	7	3	1.77	
	Armrest Foam 2	173.1	18	7	3	1.74	
	Stuffed Pillow Fabric 1 - Low	180.9	40	30	n/a		0.048
	Stuffed Pillow Fabric 1 - High	175.8	40	30	n/a		0.047
	Stuffed Pillow Fabric 2 - Low	176.1	40	30	n/a		0.047
	Stuffed Pillow Fabric 2 - High	173.4	40	30	n/a		0.046
	Stuffed Pillow Fabric 3 - Low	175.3	40	30	n/a		0.046
	Stuffed Pillow Fabric 3 - High	174.9	40	30	n/a		0.046

Tested by: \_\_\_\_\_

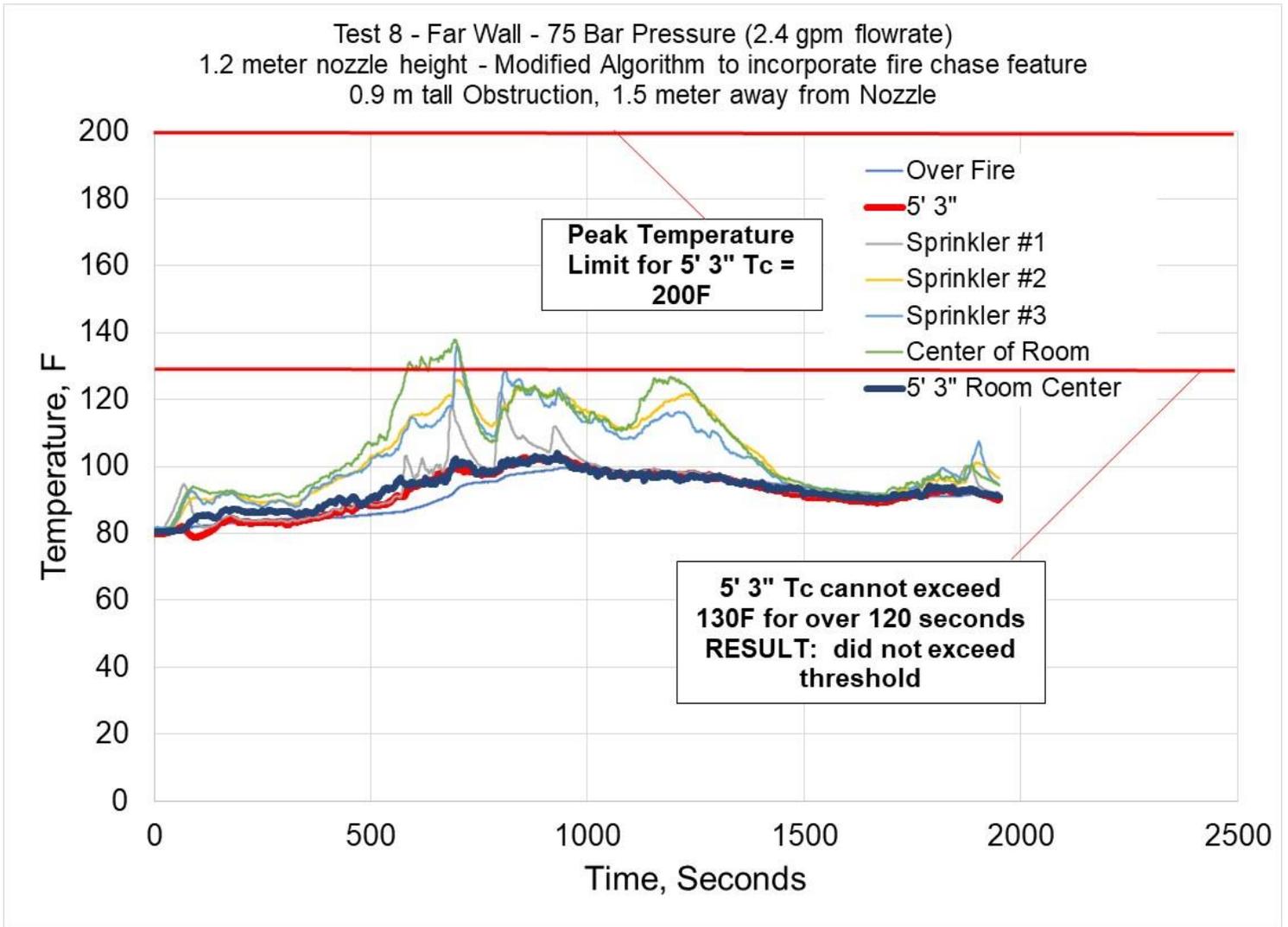
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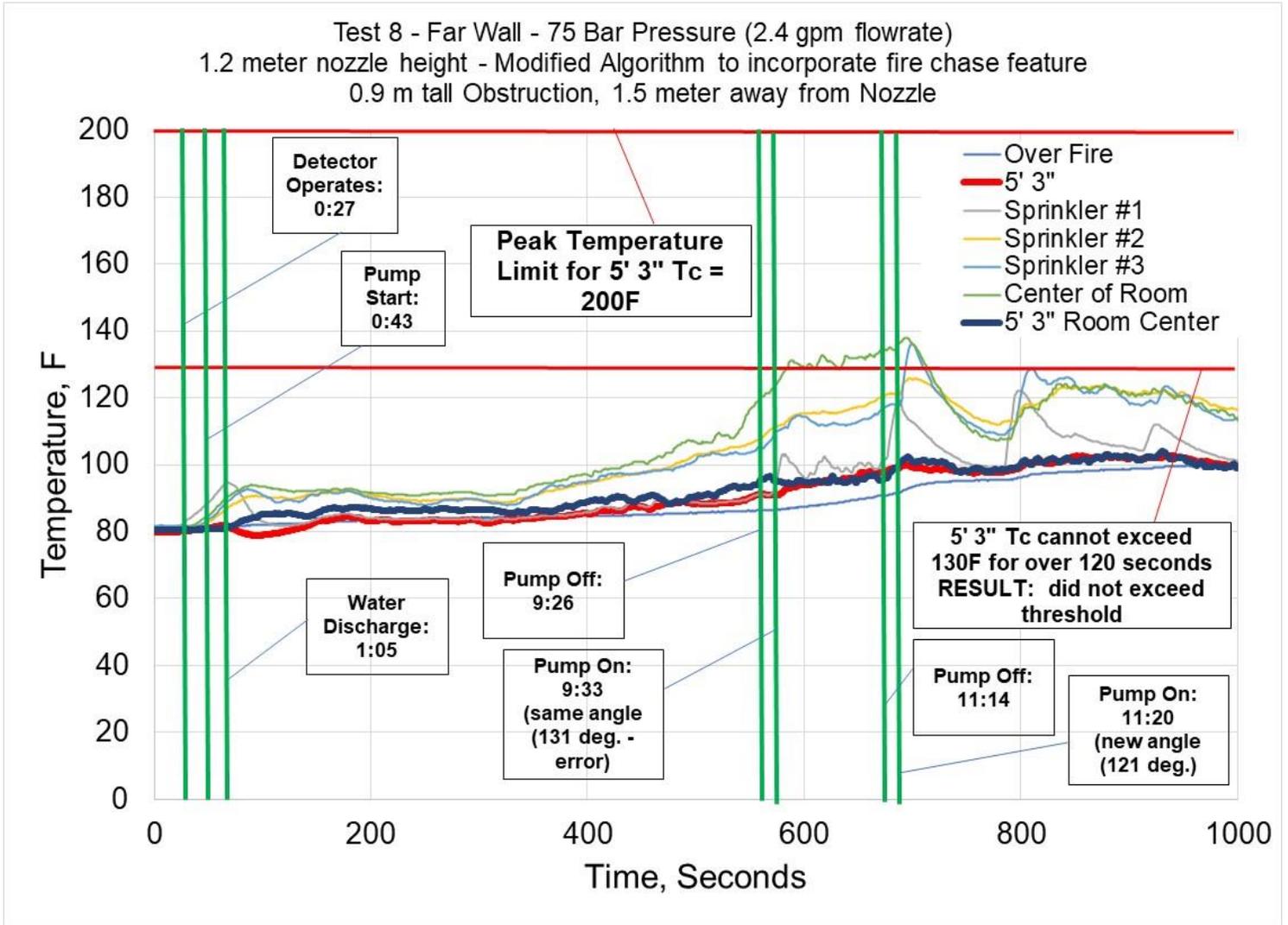
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TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room						
Test Number	8		Test Date	July 8, 2022		
Fire Test Code	07082201		Fuel Package	Fabricated Sofa with Plywood Wall Covering		
Tested per section	24	Of UL 2167B	Test Room	Building 2		
Test Configuration	Living Room		Room Size	14 ft. 8 in. by 26 ft. 3 in.	ft. by ft.	
Operating Nozzle location with respect to fire	Far Wall		Algorithm Designation	v1.5_AH-0-da27e88		
Obstruction Detail	0.9 m tall obstruction, 1.5 m away from far wall nozzle, in line with center of sofa		Flowing Pressure	1,098	psig	
Lateral position of nozzle in room	Centered on Far Wall		Nominal K-factor	0.072	gpm/psig <sup>0.5</sup>	
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	47-1/4 (1.2 m)	in.	
Event			Operation Sequence, Time; min:sec			
Smoke detector Operation Time (nozzle scanning start time)			0:27			
Pump Start			0:43			
Nozzle Discharge Start			1:05			
Test Duration			30:44			
			Trajectory Information			
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees			131			
Coanda Compensated Angle, degrees			131			
			Fire Angle	Coanda Angle	Pump On	Pump Off
Fire chase feature detail			131	131	0:43	9:26
			131 (error)	131	9:33	11:14
			121	121	11:20	14:01
			121 (error)	121	14:08	15:09
			121 (error)	121	15:15	30:44
Thermocouple ID#	Location		Maximum Ceiling Temperature, °F			
Tc #1	Above Fire Embedded in Ceiling Tile		100			
Tc #2	5 ft. 3 in. above test room floor near fuel package		103			
Tc #3	3 inches below Ceiling Near "First Sprinkler"		122			
Tc #4	3 inches below Ceiling Near "Second Sprinkler"		126			
Tc #5	3 inches below Ceiling Near "Doorway Location"		136			
Tc #6	3 inches below Ceiling - Center of Room		138			
Tc #7	5 ft. 3 in. above test room floor (Centered on Room)		104			
Thermocouple Location (ID#)			Temperature Criteria	Results		
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)			Cannot exceed 500°F	A		
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)			Cannot exceed 200°F	A		
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)			Cannot exceed 600°F	A		
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)			Cannot exceed 600°F	A		
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)			Cannot exceed 200°F	A		
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F			Cannot exceed 130 °F for 120 seconds	A (did not exceed threshold)		
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F			Cannot exceed 130 °F for 120 seconds	A (did not exceed threshold)		
A - Acceptable B - Unacceptable N/A - Not Applicable						

**Residential Fire Test Data - Full Test - Test 8**



**Residential Fire Test Data - Early Part of Test - Test 8**





Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room				
Test Number	9		Test Date	July 11, 2022
Fire Test Code	07112201		Fuel Package	Fabricated Sofa with Plywood Wall Covering
Tested per section	24	Of UL 2167B	Test Room	Building 2
Test Configuration	Living Room		Room Size	14 ft. 8 in. by 26 ft. 3 in. ft. by ft.
Operating Nozzle location with respect to fire	Near Wall		Algorithm Designation	v1.5_AH-0-da27e88
Obstruction Detail	0.9 m tall obstruction, 1.5 m away from near wall nozzle, 6 ft. deep (against sofa)		Flowing Pressure	1,100 psig
Lateral position of nozzle in room	1.5 m away from the trailing edge of the couch		Nominal K-factor	0.072 gpm/psig <sup>0.5</sup>
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	47-1/4 (1.2 m) in.
Event		Operation Sequence, Time; min:sec		
Smoke detector Operation Time (nozzle scanning start time)		0:30		
Pump Start		2:20		
Nozzle Discharge Start		2:40		
Test Duration		32:20		
Trajectory Information				
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees		21		
Coanda Compensated Angle, degrees		31		
	Fire Angle	Coanda Angle	Pump On	Pump Off
Fire chase feature detail	21	31	2:20	32:20
Thermocouple ID#	Location		Maximum Ceiling Temperature, °F	
Tc #1	Above Fire Embedded in Ceiling Tile		110	
Tc #2	5 ft. 3 in. above test room floor near fuel package		178	
Tc #3	3 inches below Ceiling Near "First Sprinkler"		231	
Tc #4	3 inches below Ceiling Near "Second Sprinkler"		167	
Tc #5	3 inches below Ceiling Near "Doorway Location"		167	
Tc #6	3 inches below Ceiling - Center of Room		181	
Tc #7	5 ft. 3 in. above test room floor (Centered on Room)		155	
Thermocouple Location (ID#)	Temperature Criteria		Results	
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)	Cannot exceed 500°F		A	
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)	Cannot exceed 200°F		A	
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)	Cannot exceed 600°F		A	
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)	Cannot exceed 600°F		A	
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)	Cannot exceed 200°F		A	
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F	Cannot exceed 130 °F for 120 seconds		B (134 seconds starting at 3:09 - see additional data point below for pass)	
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F	Cannot exceed 130 °F for 120 seconds		A* (115 seconds starting at 3:22)	
A - Acceptable B - Unacceptable N/A - Not Applicable				
Comments:		* Kerry Bell (PDE) agreed to having an additional 5 ft. 3 in. Tc added to the center of the room for this acceptance criteria. Since the center of the room passes, this is an acceptable test.		

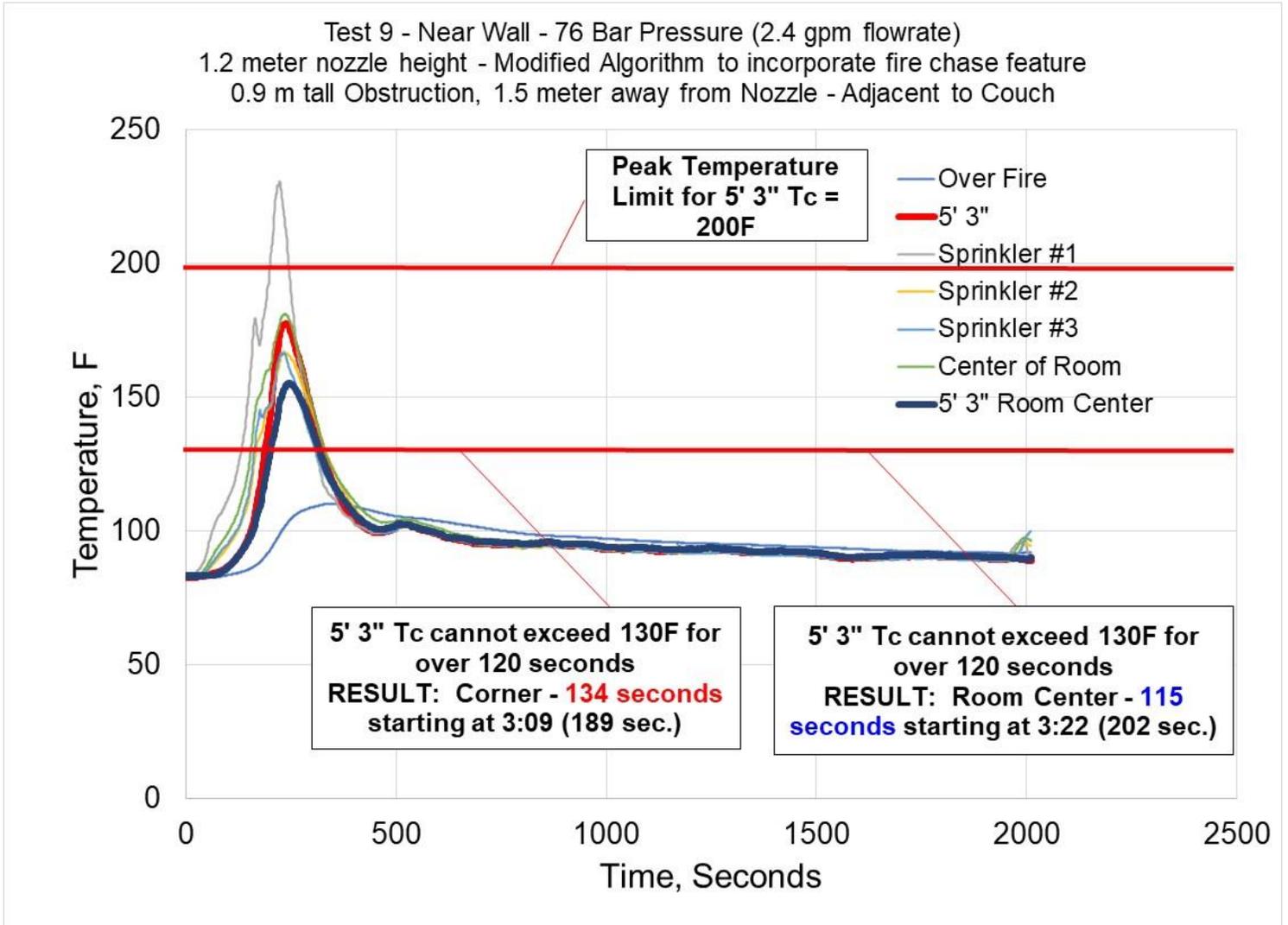
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Date \_\_\_\_\_

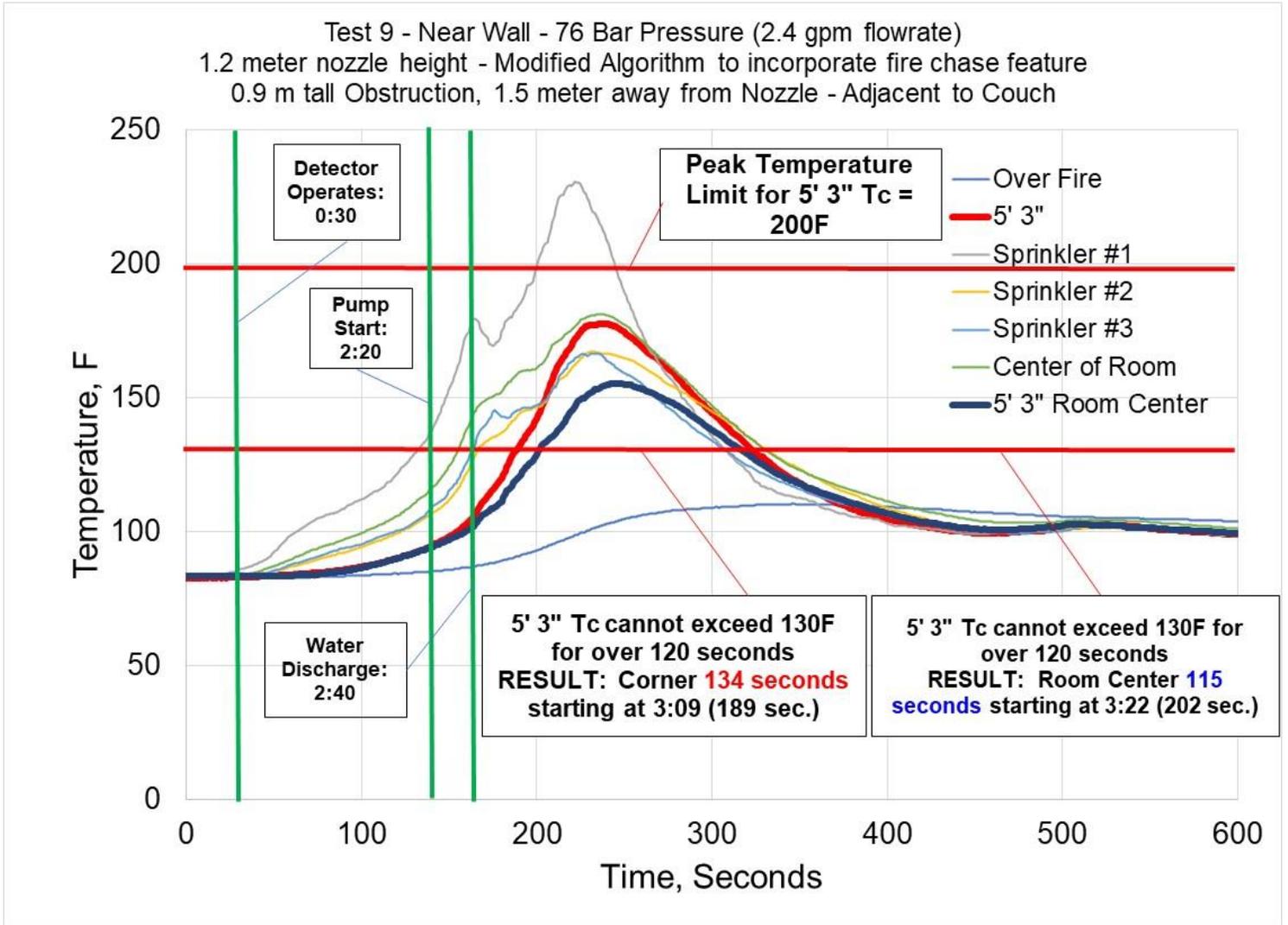
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**Residential Fire Test Data - Full Test - Test 9**



Residential Fire Test Data - Early Part of Test - Test 9



Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

**Residential Fire Mass List - Test 10**

<b>Residential Fire Test Mass List</b>							
<b>Test Number</b>	10						
<b>Test Date</b>	July 12, 2022						
<b>Component Description</b>	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	<b>Volume Density</b>	<b>Area Density</b>	
	<b>pounds</b>	<b>inches</b>	<b>inches</b>	<b>inches</b>	<b>pounds/ cubic foot</b>	<b>pounds/ square foot</b>	
			<b>Requirement:</b>		1.6 - 1.9	0.046 - 0.053	
Back Cushion	14.30	72.5	24.25	8	1.76		
Seat Cushion	15.30	72	26	8	1.77		
Back Cushion fabric	2.20	164	42	n/a		0.046	
Seat Cushion fabric	2.20	164	42	n/a		0.046	
Stuffed Pillow 1 - Final	5.85	32	21	12.5			
Stuffed Pillow 2 - Final	5.85	32	22	12.5			
Stuffed Pillow 3 - Final	5.85	32	21.5	12.5			
	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>			
	<b>grams</b>	<b>inches</b>	<b>inches</b>	<b>inches</b>			
Armrest Foam 1	182.5	18	7	3	1.84		
Armrest Foam 2	180.7	18	7	3	1.82		
Stuffed Pillow Fabric 1 - Low	177.6	40	30	n/a		0.047	
Stuffed Pillow Fabric 1 - High	176.7	40	30	n/a		0.047	
Stuffed Pillow Fabric 2 - Low	176.0	40	30	n/a		0.047	
Stuffed Pillow Fabric 2 - High	176.4	40	30	n/a		0.047	
Stuffed Pillow Fabric 3 - Low	176.4	40	30	n/a		0.047	
Stuffed Pillow Fabric 3 - High	175.6	40	30	n/a		0.046	

Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room				
Test Number	10		Test Date	July 12, 2022
Fire Test Code	07122201		Fuel Package	Fabricated Sofa with Plywood Wall Covering
Tested per section	24	Of UL 2167B	Test Room	Building 2
Test Configuration	Living Room		Room Size	14 ft. 8 in. by 26 ft. 3 in. ft. by ft.
Operating Nozzle location with respect to fire	Far Wall		Algorithm Designation	v1.5_AH-0-da27e88
Obstruction Detail	0.9 m tall obstruction, 6 inches away from couch, 8 ft. width		Flowing Pressure	1,100 psig
Lateral position of nozzle in room	Centered on Far Wall		Nominal K-factor	0.072 gpm/psig <sup>0.5</sup>
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	47-1/4 (1.2 m) in.
Event		Operation Sequence, Time; min:sec		
Smoke detector Operation Time (nozzle scanning start time)		0:32		
Pump Start		1:39		
Nozzle Discharge Start		2:00		
Test Duration		31:39		
Trajectory Information				
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees		122		
Coanda Compensated Angle, degrees		122		
		Fire Angle	Coanda Angle	Pump On Pump Off
Fire chase feature detail		122 129.5	122 129.5	1:38 3:46 3:39 31:39
Thermocouple ID#	Location			Maximum Ceiling Temperature, °F
Tc #1	Above Fire Embedded in Ceiling Tile			94
Tc #2	5 ft. 3 in. above test room floor near fuel package			109
Tc #3	3 inches below Ceiling Near "First Sprinkler"			135
Tc #4	3 inches below Ceiling Near "Second Sprinkler"			127
Tc #5	3 inches below Ceiling Near "Doorway Location"			138
Tc #6	3 inches below Ceiling - Center of Room			131
Tc #7	5 ft. 3 in. above test room floor (Centered on Room)			107
Thermocouple Location (ID#)	Temperature Criteria		Results	
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)	Cannot exceed 500°F		A	
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)	Cannot exceed 200°F		A	
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)	Cannot exceed 600°F		A	
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)	Cannot exceed 600°F		A	
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)	Cannot exceed 200°F		A	
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F	Cannot exceed 130 °F for 120 seconds		A (did not exceed threshold)	
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F	Cannot exceed 130 °F for 120 seconds		A (did not exceed threshold)	
A - Acceptable B - Unacceptable N/A - Not Applicable				
Comments:				

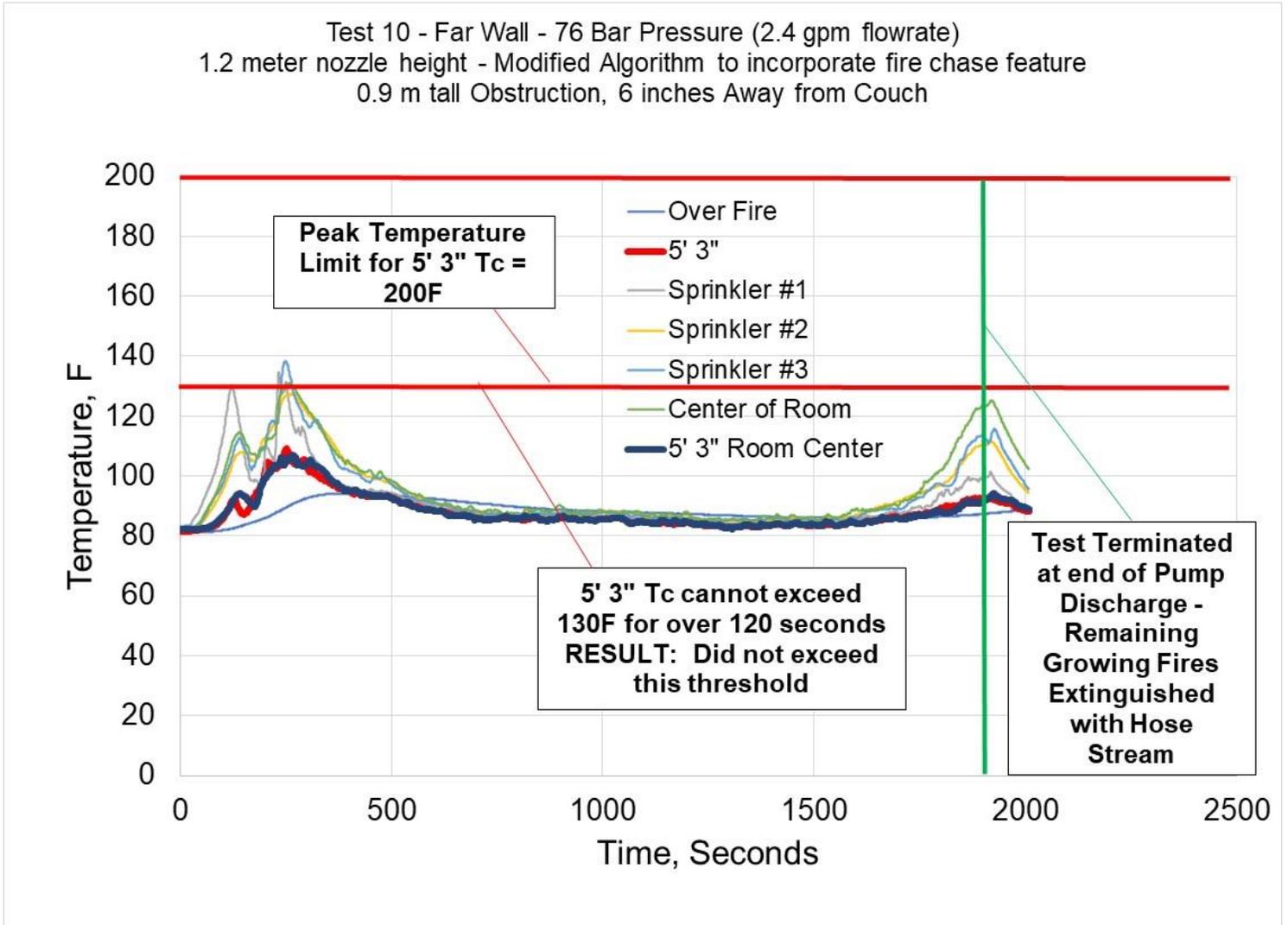
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Date \_\_\_\_\_

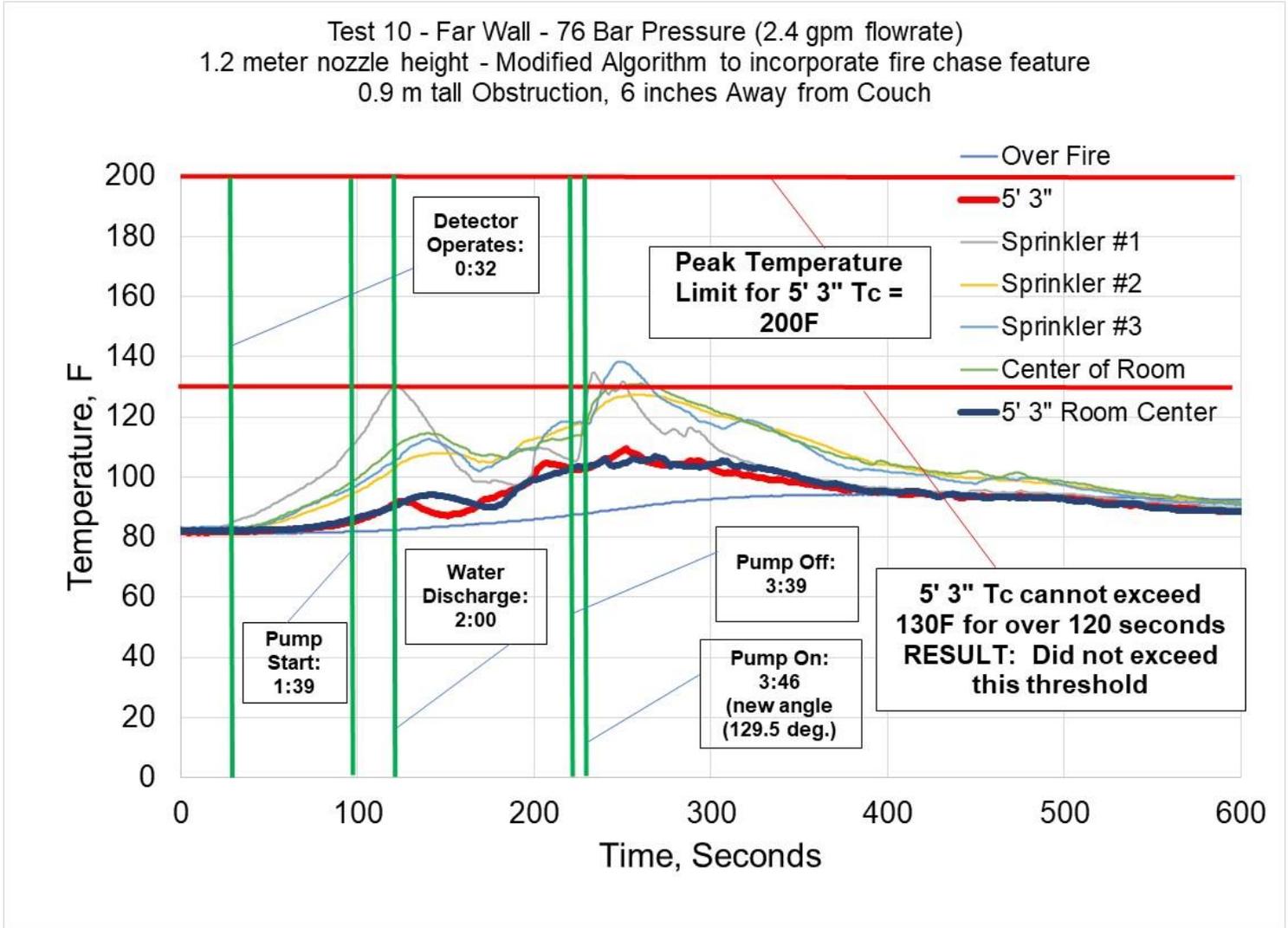
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**Residential Fire Test Data - Full Test - Test 10**



Residential Fire Test Data - Early Part of Test - Test 10



Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

**Residential Fire Mass List - Test 10A**

<b>Residential Fire Test Mass List</b>						
<b>Test Number</b>	10A					
<b>Test Date</b>	July 13, 2022					
	<b>Component Description</b>	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	<b>Volume Density</b>
		pounds	inches	inches	inches	pounds/ cubic foot
	<b>Requirement:</b>	5.5 - 7.1				
	Wood Crib	6.85	12	12	6	
	<b>Requirement:</b>					1.7 - 1.9
		<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	
		grams	inches	inches	inches	
	Cushion #1	1366	30	32	3	1.81
	Cushion #2	1364	30	32	3	1.80

Tested by: \_\_\_\_\_

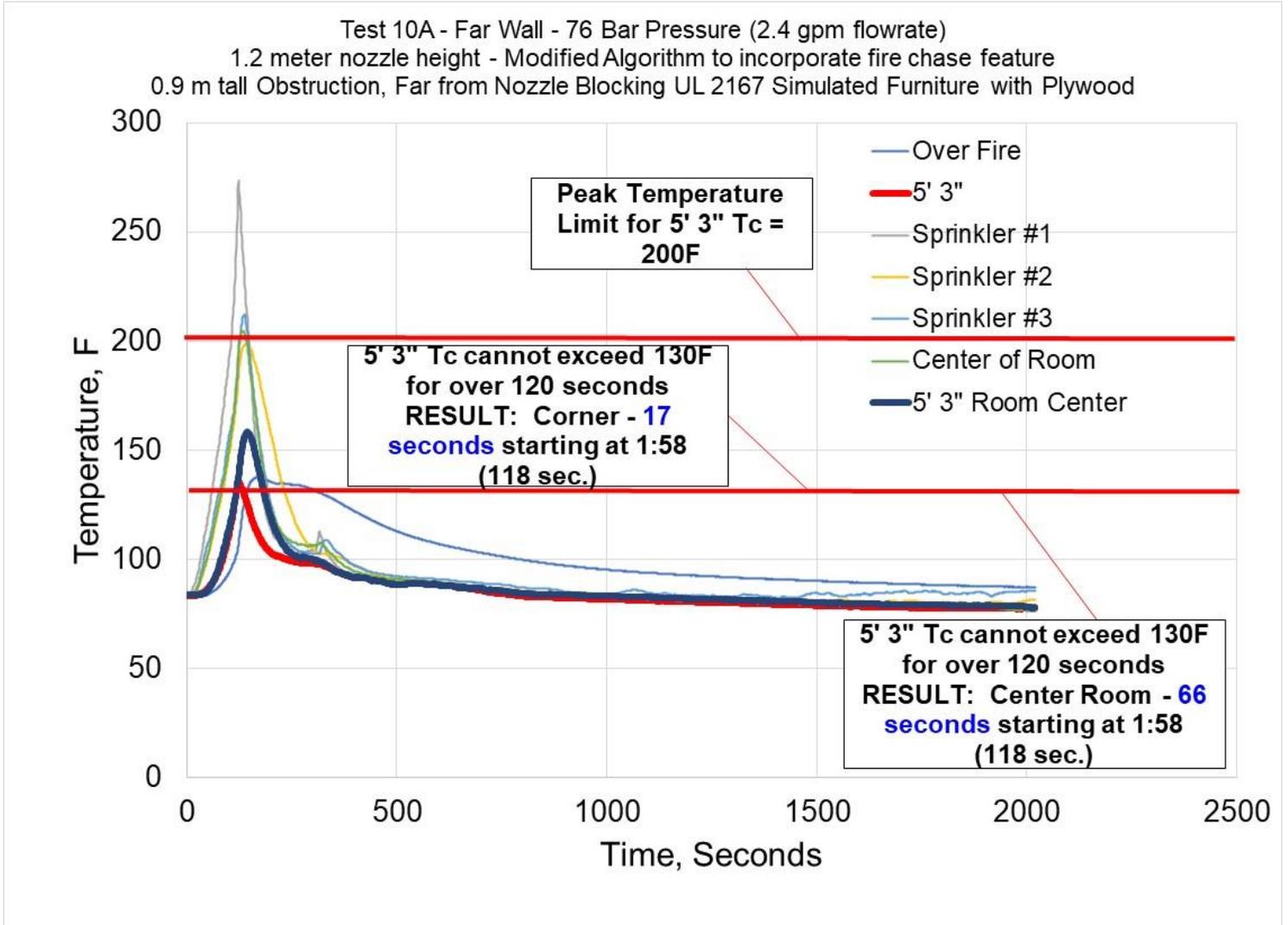
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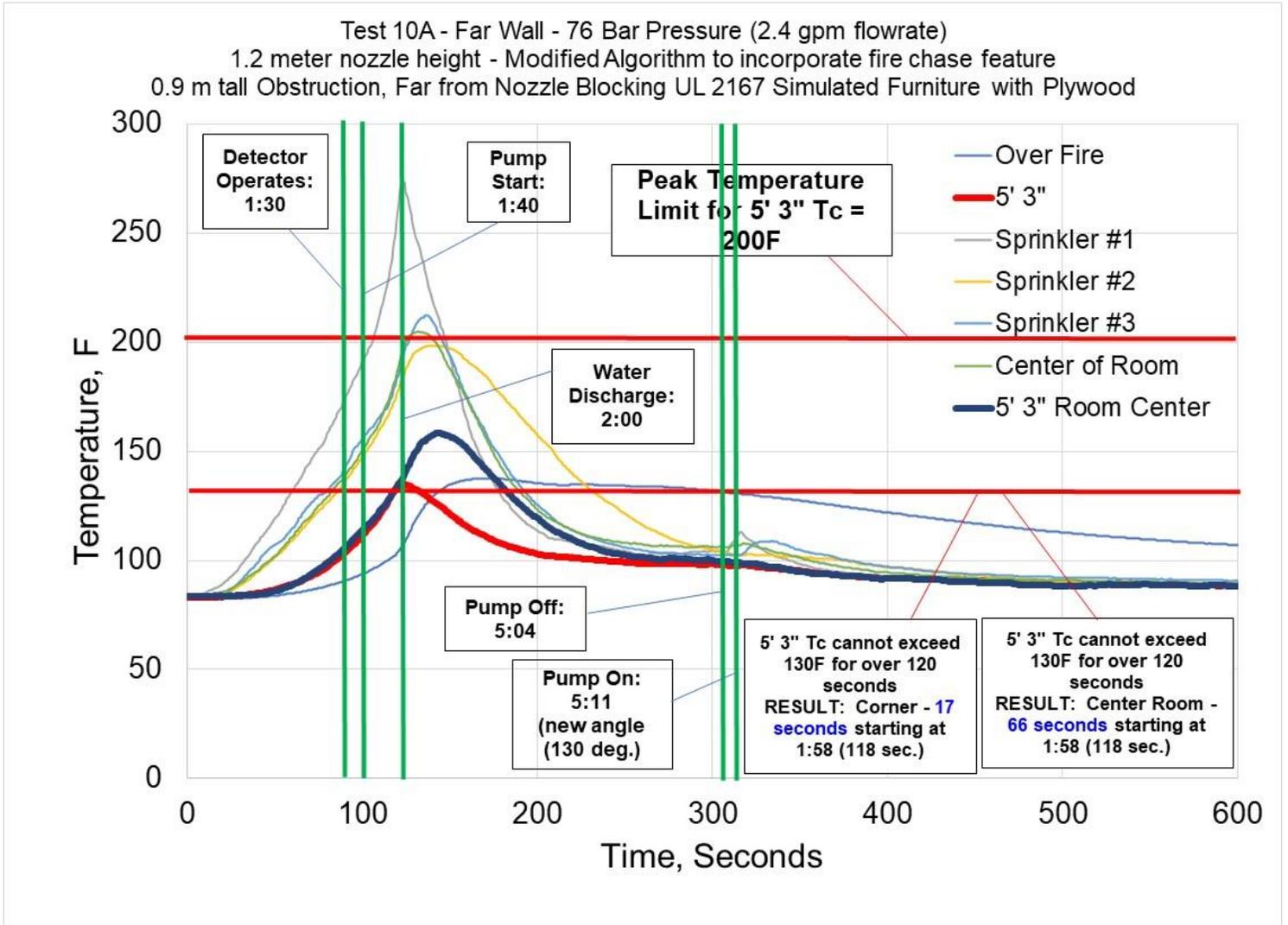
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TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room					
Test Number	10A		Test Date	July 13, 2022	
Fire Test Code	07132201		Fuel Package	UL 2167 simulated furniture with plywood	
Tested per section	24	Of UL 2167B	Test Room	Building 2	
Test Configuration	Living Room		Room Size	14 ft. 8 in. by 26 ft. 3 in. ft. by ft.	
Operating Nozzle location with respect to fire	Far Wall		Algorithm Designation	v1.5_AH-0-da27e88	
Obstruction Detail	0.9 m tall obstruction, 45 degree angle with respect to UL 2167 fuel package - as close as possible to frames		Flowing Pressure	1,100 psig	
Lateral position of nozzle in room	Centered on Far Wall		Nominal K-factor	0.072 gpm/psig <sup>0.5</sup>	
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	47-1/4 (1.2 m) in.	
Event		Operation Sequence, Time; min:sec			
Smoke detector Operation Time (nozzle scanning start time)		1:30			
Pump Start		1:40			
Nozzle Discharge Start		2:00			
Test Duration		31:40			
Trajectory Information					
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees		133			
Coanda Compensated Angle, degrees		133			
		Fire Angle	Coanda Angle	Pump On	Pump Off
Fire chase feature detail		133	133	1:40	5:04
		130	130	5:11	31:41
Thermocouple ID#	Location			Maximum Ceiling Temperature, °F	
Tc #1	Above Fire Embedded in Ceiling Tile			138	
Tc #2	5 ft. 3 in. above test room floor near fuel package			136	
Tc #3	3 inches below Ceiling Near "First Sprinkler"			273	
Tc #4	3 inches below Ceiling Near "Second Sprinkler"			198	
Tc #5	3 inches below Ceiling Near "Doorway Location"			212	
Tc #6	3 inches below Ceiling - Center of Room			205	
Tc #7	5 ft. 3 in. above test room floor (Centered on Room)			158	
Thermocouple Location (ID#)	Temperature Criteria		Results		
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)	Cannot exceed 500°F		A		
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)	Cannot exceed 200°F		A		
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)	Cannot exceed 600°F		A		
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)	Cannot exceed 600°F		A		
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)	Cannot exceed 200°F		A		
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F	Cannot exceed 130 °F for 120 seconds		A (17 seconds starting at 1:58)		
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F	Cannot exceed 130 °F for 120 seconds		A (66 seconds starting at 1:58)		
A - Acceptable B - Unacceptable N/A - Not Applicable					
Comments:					

Residential Fire Test Data - Full Test - Test 10A



**Residential Fire Test Data - Early Part of Test - Test 10A**



Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

**Residential Fire Mass List - Test 11**

<b>Residential Fire Test Mass List</b>						
<b>Test Number</b>	11					
<b>Test Date</b>	July 14, 2022					
	<b>Component Description</b>	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	<b>Volume Density</b>
		pounds	inches	inches	inches	pounds/ cubic foot
	<b>Requirement:</b>	5.5 - 7.1				
	Wood Crib	7.00	12	12	6	
	<b>Requirement:</b>					1.7 - 1.9
		<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	
		grams	inches	inches	inches	
	Cushion #1	1337	30	32	3	1.77
	Cushion #2	1338	30	32	3	1.77

Tested by: \_\_\_\_\_

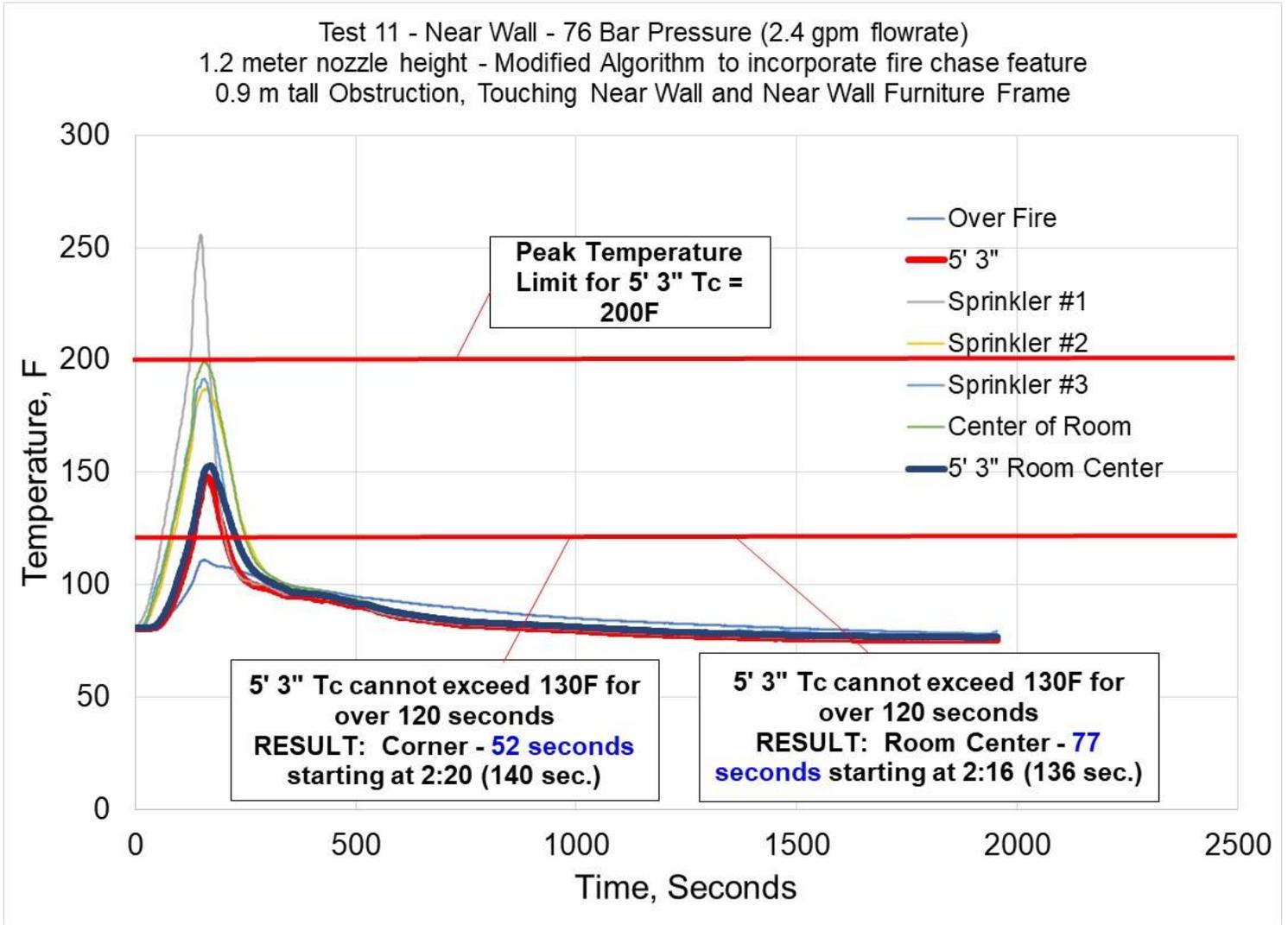
Date \_\_\_\_\_

Printed Name

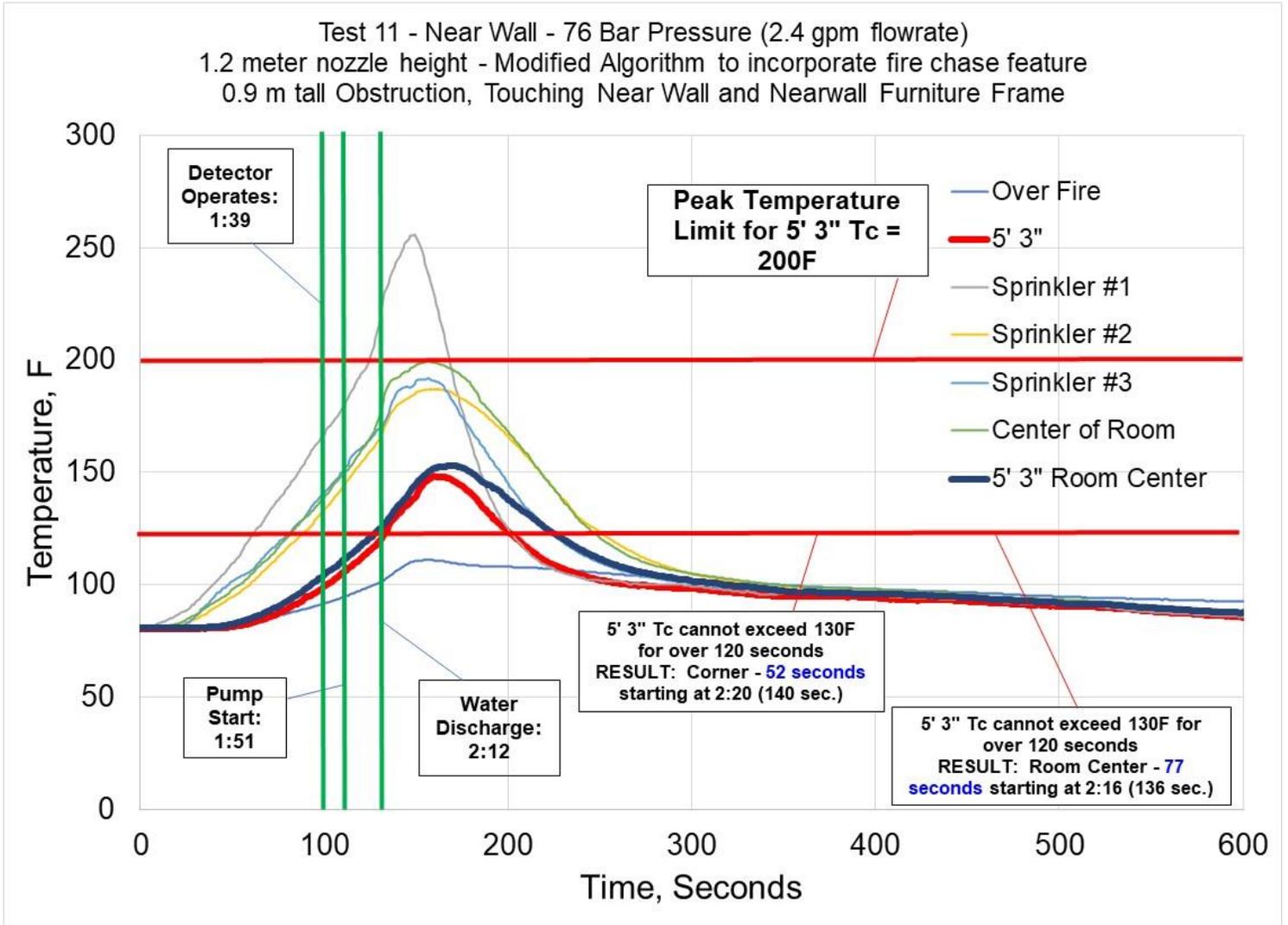
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TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room				
Test Number	11		Test Date	July 14, 2022
Fire Test Code	07142201		Fuel Package	UL 2167 simulated furniture with plywood
Tested per section	24	Of UL 2167B	Test Room	Building 2
Test Configuration	Living Room		Room Size	14 ft. 8 in. by 26 ft. 3 in. ft. by ft.
Operating Nozzle location with respect to fire	Near Wall		Algorithm Designation	v1.5_AH-0-da27e88
Obstruction Detail	0.9 m tall obstruction, as close as possible to left most UL 2167 fuel package frame (70 in. away from short wall)		Flowing Pressure	1,100 psig
Lateral position of nozzle in room	Centered on Near Wall		Nominal K-factor	0.072 gpm/psig <sup>0.5</sup>
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	47-1/4 (1.2 m) in.
Event				
Event			Operation Sequence, Time; min:sec	
Smoke detector Operation Time (nozzle scanning start time)			1:39	
Pump Start			1:51	
Nozzle Discharge Start			2:12	
Test Duration			31:51	
Trajectory Information				
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees			2	
Coanda Compensated Angle, degrees			28	
			Fire Angle	Coanda Angle
Fire chase feature detail			2	28
			Pump On	Pump Off
			1:51	31:51
Thermocouple ID#	Location		Maximum Ceiling Temperature, °F	
Tc #1	Above Fire Embedded in Ceiling Tile		111	
Tc #2	5 ft. 3 in. above test room floor near fuel package		148	
Tc #3	3 inches below Ceiling Near "First Sprinkler"		256	
Tc #4	3 inches below Ceiling Near "Second Sprinkler"		187	
Tc #5	3 inches below Ceiling Near "Doorway Location"		192	
Tc #6	3 inches below Ceiling - Center of Room		199	
Tc #7	5 ft. 3 in. above test room floor (Centered on Room)		153	
Thermocouple Location (ID#)	Temperature Criteria		Results	
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)	Cannot exceed 500°F		A	
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)	Cannot exceed 200°F		A	
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)	Cannot exceed 600°F		A	
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)	Cannot exceed 600°F		A	
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)	Cannot exceed 200°F		A	
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F	Cannot exceed 130 °F for 120 seconds		A (52 seconds starting at 2:20)	
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F	Cannot exceed 130 °F for 120 seconds		A (77 seconds starting at 2:16)	
A - Acceptable B - Unacceptable N/A - Not Applicable				
Comments:				

**Residential Fire Test Data - Full Test - Test 11**



Residential Fire Test Data - Early Part of Test - Test 11



Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

**Residential Fire Mass List - Test 12**

Residential Fire Test Mass List							
<b>Test Number</b>	12						
<b>Test Date</b>	July 21, 2022						
<b>Component Description</b>	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	<b>Volume Density</b>	<b>Area Density</b>	
	pounds	inches	inches	inches	pounds/ cubic foot	pounds/ square foot	
			<b>Requirement:</b>		1.6 - 1.9	0.046 - 0.053	
Back Cushion	13.75	72	24	8	1.72		
Seat Cushion	15.65	72.25	26	8	1.80		
Back Cushion fabric	2.25	164	42	n/a		0.047	
Seat Cushion fabric	2.20	164	42	n/a		0.046	
Stuffed Pillow 1 - Final	5.85	31.5	21.5	13			
Stuffed Pillow 2 - Final	5.85	32	21.5	12.5			
Stuffed Pillow 3 - Final	5.85	32	21	12.5			
	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>			
	grams	inches	inches	inches			
Armrest Foam 1	180.2	18	7	3	1.82		
Armrest Foam 2	186.6	18	7	3	1.88		
Stuffed Pillow Fabric 1 - Low	175.0	40	30	n/a		0.046	
Stuffed Pillow Fabric 1 - High	176.6	40	30	n/a		0.047	
Stuffed Pillow Fabric 2 - Low	175.1	40	30	n/a		0.046	
Stuffed Pillow Fabric 2 - High	175.4	40	30	n/a		0.046	
Stuffed Pillow Fabric 3 - Low	175.1	40	30	n/a		0.046	
Stuffed Pillow Fabric 3 - High	174.3	40	30	n/a		0.046	

Tested by: \_\_\_\_\_

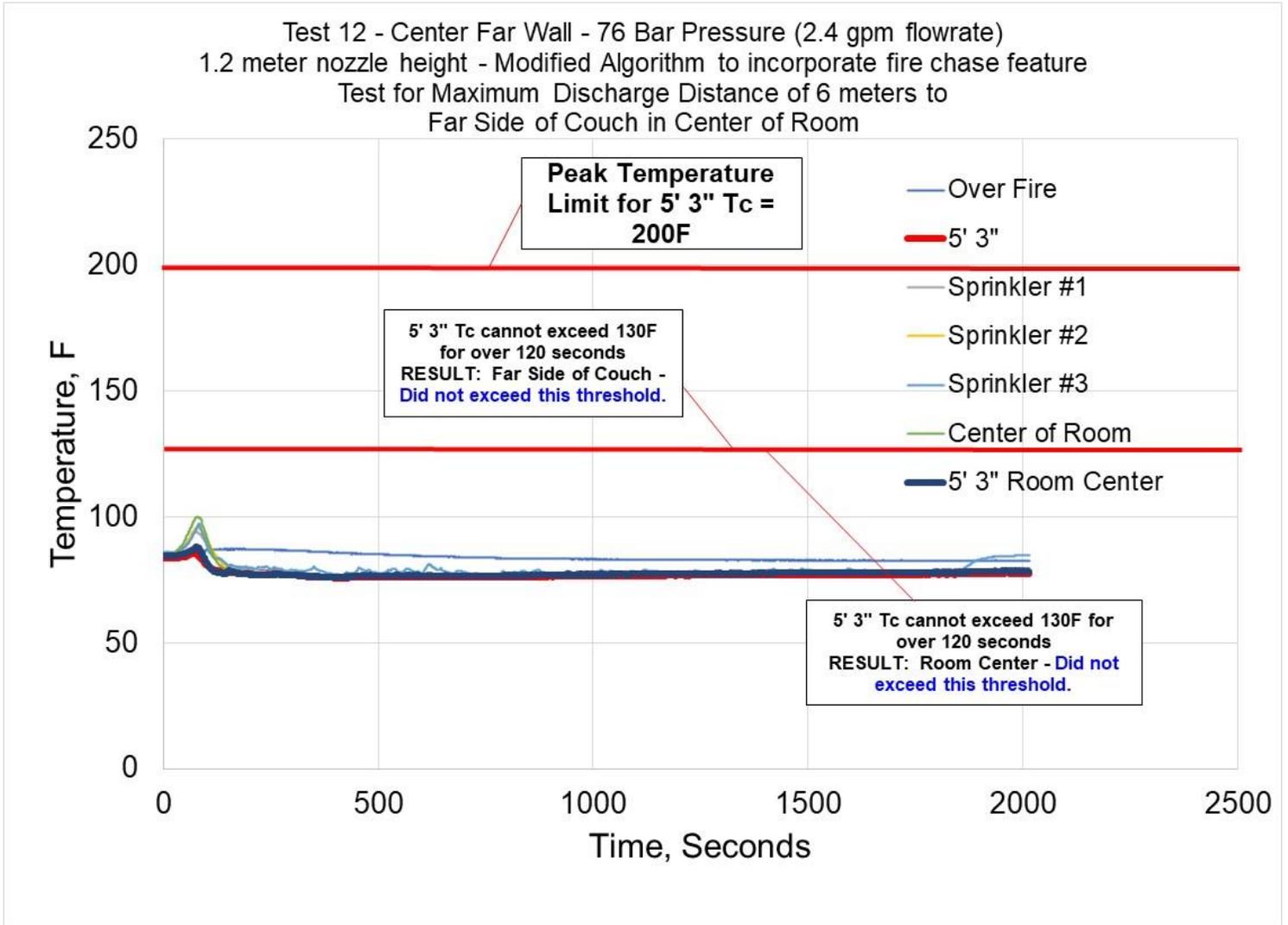
Date \_\_\_\_\_

Printed Name

Signature

TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room				
Test Number	12		Test Date	July 21, 2022
Fire Test Code	07212201		Fuel Package	Fabricated Sofa with Plywood Wall Covering - In Room Center - Back edge 6 m away from discharging nozzle
Tested per section	24	Of UL 2167B	Test Room	Building 2
Test Configuration	Living Room		Room Size	14 ft. 8 in. by 26 ft. 3 in. ft. by ft.
Operating Nozzle location with respect to fire	Centered on Short Wall		Algorithm Designation	v1.5_AH-0-da27e88
Obstruction Detail	Not applicable (none)		Flowing Pressure	1,100 psig
Lateral position of nozzle in room	Centered on Far Short Wall		Nominal K-factor	0.072 gpm/psig <sup>0.5</sup>
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	47-1/4 (1.2 m) in.
<b>Event</b>			<b>Operation Sequence, Time; min:sec</b>	
Smoke detector Operation Time (nozzle scanning start time)			0:32	
Pump Start			0:47	
Nozzle Discharge Start			1:08	
Test Duration			30:46	
			<b>Trajectory Information</b>	
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees			97	
Coanda Compensated Angle, degrees			97	
			<b>Fire Angle</b>	<b>Coanda Angle</b>
Fire chase feature detail			97	97
			<b>Pump On</b>	<b>Pump Off</b>
			0:47	30:46
<b>Thermocouple ID#</b>	<b>Location</b>			<b>Maximum Ceiling Temperature, °F</b>
Tc #1	Above Fire Embedded in Ceiling Tile			87
Tc #2	5 ft. 3 in. above test room floor near fuel package			86
Tc #3	3 inches below Ceiling Near "First Sprinkler"			95
Tc #4	3 inches below Ceiling Near "Second Sprinkler"			96
Tc #5	3 inches below Ceiling Near "Doorway Location"			97
Tc #6	3 inches below Ceiling - Center of Room			100
Tc #7	5 ft. 3 in. above test room floor (Centered on Room)			88
<b>Thermocouple Location (ID#)</b>		<b>Temperature Criteria</b>		<b>Results</b>
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)		Cannot exceed 500°F		A
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)		Cannot exceed 200°F		A
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)		Cannot exceed 600°F		A
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)		Cannot exceed 600°F		A
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)		Cannot exceed 200°F		A
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F		Cannot exceed 130 °F for 120 seconds		A (did not exceed threshold)
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F		Cannot exceed 130 °F for 120 seconds		A (did not exceed threshold)
A - Acceptable B - Unacceptable N/A - Not Applicable				
Comments:				

**Residential Fire Test Data - Full Test - Test 12**



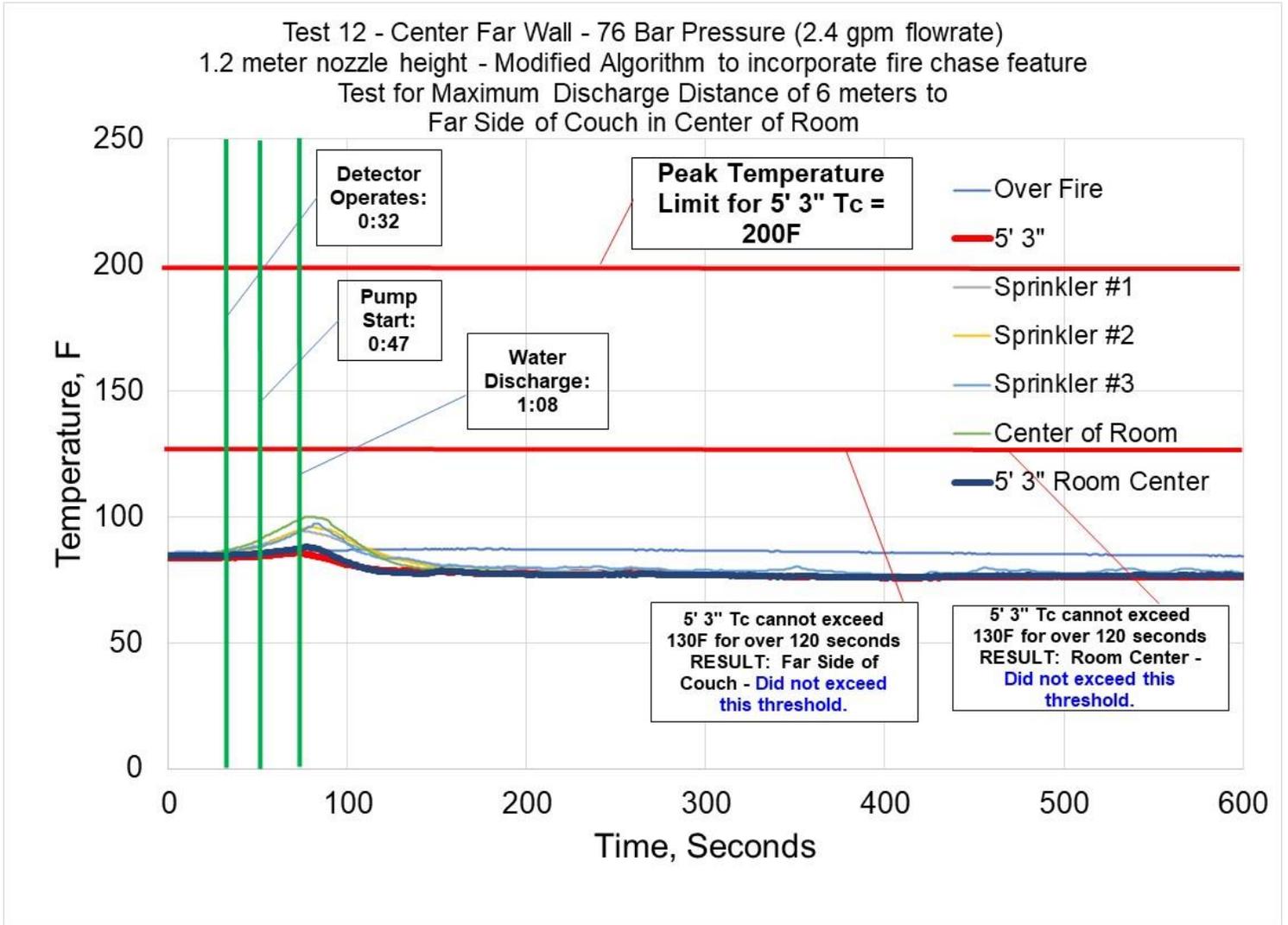
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Date \_\_\_\_\_

Printed Name

Signature

Residential Fire Test Data - Early Part of Test - Test 12



Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

**Residential Fire Mass List - Test 13**

Residential Fire Test Mass List							
<b>Test Number</b>	13						
<b>Test Date</b>	February 2, 2023						
<b>Component Description</b>	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	<b>Volume Density</b>	<b>Area Density</b>	
	<b>pounds</b>	<b>inches</b>	<b>inches</b>	<b>inches</b>	<b>pounds/ cubic foot</b>	<b>pounds/ square foot</b>	
			<b>Requirement:</b>		1.6 - 1.9	0.046 - 0.053	
Back Cushion	14.04	72	24	8	1.76		
Seat Cushion	15.55	71.75	25.75	8	1.82		
Back Cushion fabric	2.205	164	42	n/a		0.046	
Seat Cushion fabric	2.220	164	42	n/a		0.046	
Stuffed Pillow 1 - Final	5.880	31	21	13			
Stuffed Pillow 2 - Final	5.865	31.5	21	12			
Stuffed Pillow 3 - Final	5.855	31	20.5	12.25			
	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>			
	<b>grams</b>	<b>inches</b>	<b>inches</b>	<b>inches</b>			
Armrest Foam 1	168.9	18	7	3	1.70		
Armrest Foam 2	166.3	18	7	3	1.68		
Stuffed Pillow Fabric 1 - Low	175.6	40	30	n/a		0.046	
Stuffed Pillow Fabric 1 - High	172.4	40	30	n/a		0.046	
Stuffed Pillow Fabric 2 - Low	175.9	40	30	n/a		0.047	
Stuffed Pillow Fabric 2 - High	174.9	40	30	n/a		0.046	
Stuffed Pillow Fabric 3 - Low	175.8	40	30	n/a		0.047	
Stuffed Pillow Fabric 3 - High	178.8	40	30	n/a		0.047	

Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room				
Test Number	13		Test Date	February 2, 2023
Fire Test Code	02022301		Fuel Package	Fabricated Sofa with Plywood Wall Covering
Tested per section	24	Of UL 2167B	Test Room	Building 2
Test Configuration	Living Room		Room Size	18 ft. by 38 ft. by ft.
Operating Nozzle location with respect to fire	Nozzle centered on short wall closest to fire was activated		Algorithm Designation	v1.5_AH-0-da27e88
Obstruction Detail	Not applicable (none)		Flowing Pressure	1,100 psig
Lateral position of nozzle in room	Four Nozzle series (centered on each wall)		Nominal K-factor	0.072 gpm/psig <sup>0.5</sup>
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	47-1/4 (1.2 m) in.
<b>Event</b>				
Smoke detector Operation Time (nozzle scanning start time) NOTE: alarm closest to fuel package operated first			Operation Sequence, Time; min:sec	
Pump Start			0:32	
Nozzle Discharge Start			0:46	
Test Duration			1:03	
			30:47	
<b>NOTE: Nozzle centered on short wall closest to fire was activated.</b>				
<b>Trajectory Information</b>				
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees			145	
Coanda Compensated Angle, degrees			144	
			Fire Angle	Coanda Angle
Fire chase feature detail			145	144
			Pump On	Pump Off
			0:46	30:47
<b>Thermocouple ID#</b>				
<b>Location</b>			<b>Maximum Ceiling Temperature, °F</b>	
Tc #1	Above Fire Embedded in Ceiling Tile			86
Tc #2	5 ft. 3 in. above test room floor near fuel package			107
Tc #3	3 inches below Ceiling Near "First Sprinkler"			104
Tc #4	3 inches below Ceiling Near "Second Sprinkler"			126
Tc #5	3 inches below Ceiling Near "Doorway Location"			128
Tc #6	3 inches below Ceiling - Center of Room			133
Tc #7	5 ft. 3 in. above test room floor (Centered on Room)			Not taken
<b>Thermocouple Location (ID#)</b>				
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)			Temperature Criteria	Results
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)			Cannot exceed 500°F	A
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)			Cannot exceed 200°F	A
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)			Cannot exceed 600°F	A
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)			Cannot exceed 600°F	A
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F			Cannot exceed 200°F	A
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F			Cannot exceed 130 °F for 120 seconds	A (did not exceed threshold)
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F			Cannot exceed 130 °F for 120 seconds	Not taken
A - Acceptable B - Unacceptable N/A - Not Applicable				
Comments:				

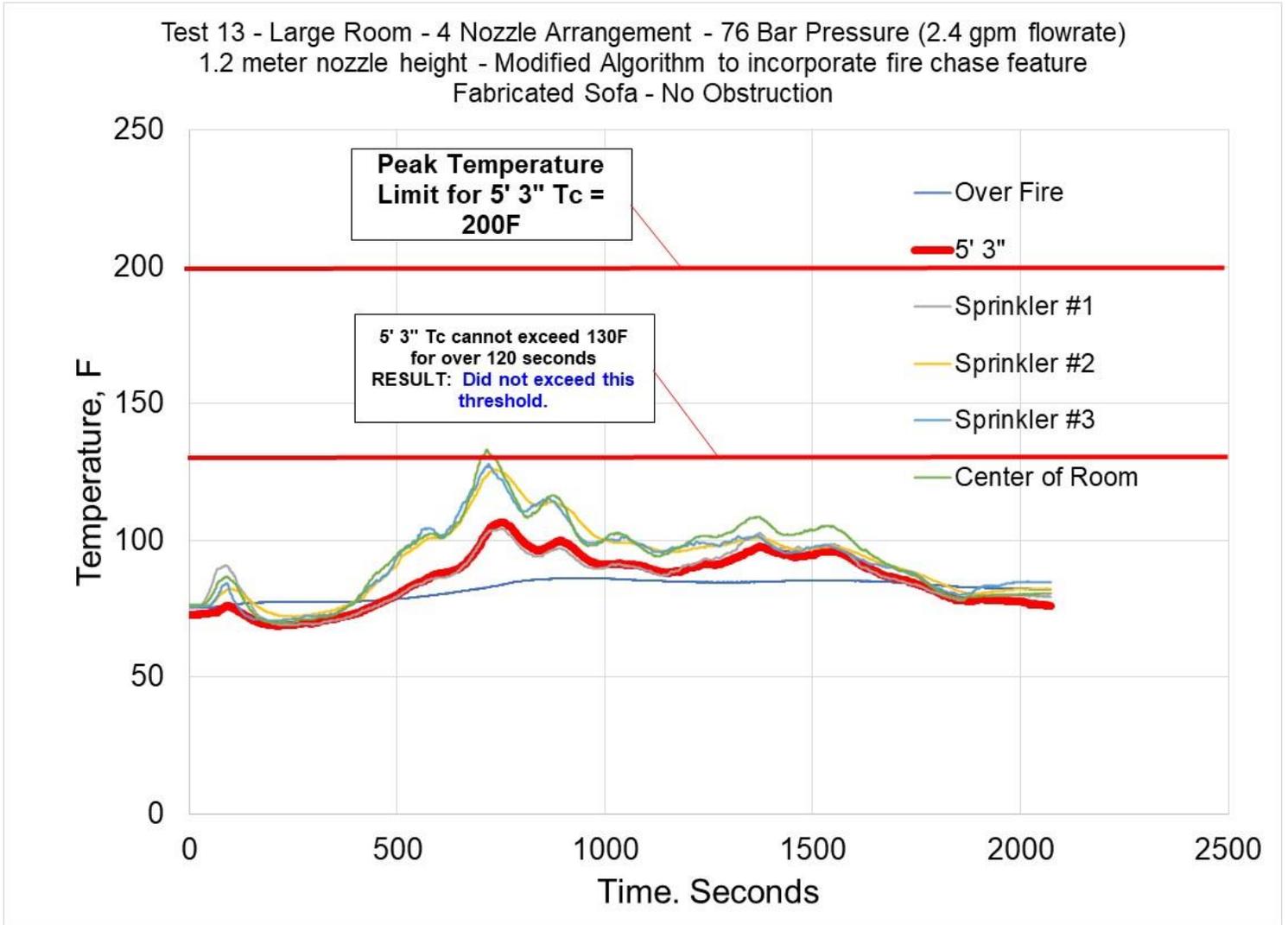
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Date \_\_\_\_\_

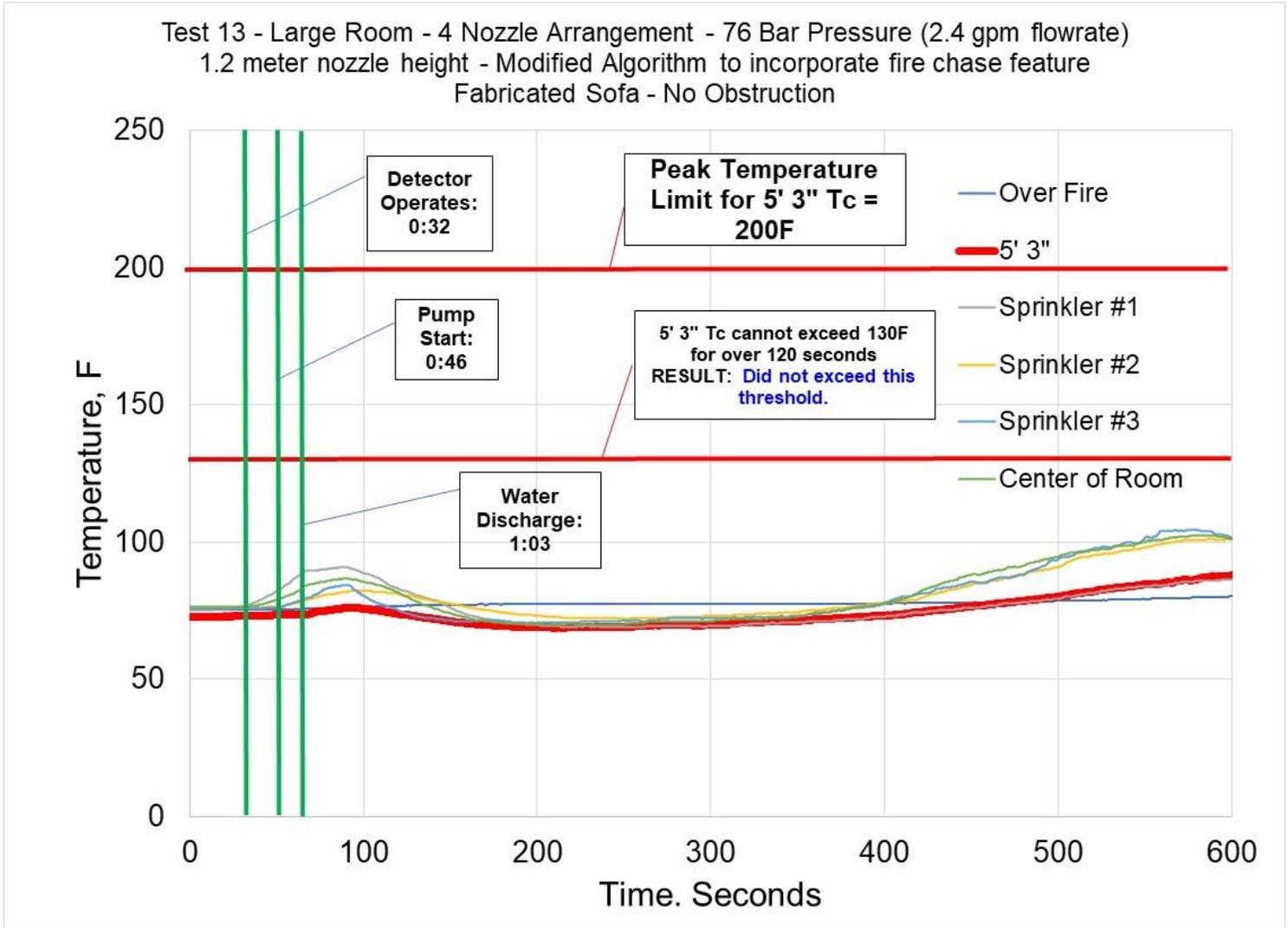
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**Residential Fire Test Data - Full Test - Test 13**



Residential Fire Test Data - Early Part of Test - Test 13



Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

**Residential Fire Mass List - Test 14**

<b>Residential Fire Test Mass List</b>						
<b>Test Number</b>	14	(14A)				
<b>Test Date</b>	February 6, 2023					
	<b>Component Description</b>	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	<b>Volume Density</b>
		pounds	inches	inches	inches	pounds/ cubic foot
	<b>Requirement:</b>	5.5 - 7.1				
	Wood Crib	6.485	12	12	6	
	<b>Requirement:</b>					1.7 - 1.9
		<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	
		grams	inches	inches	inches	
	Cushion #1	1383	30	32	3	1.83
	Cushion #2	1308	30	32	3	1.73

Tested by: \_\_\_\_\_

Date \_\_\_\_\_

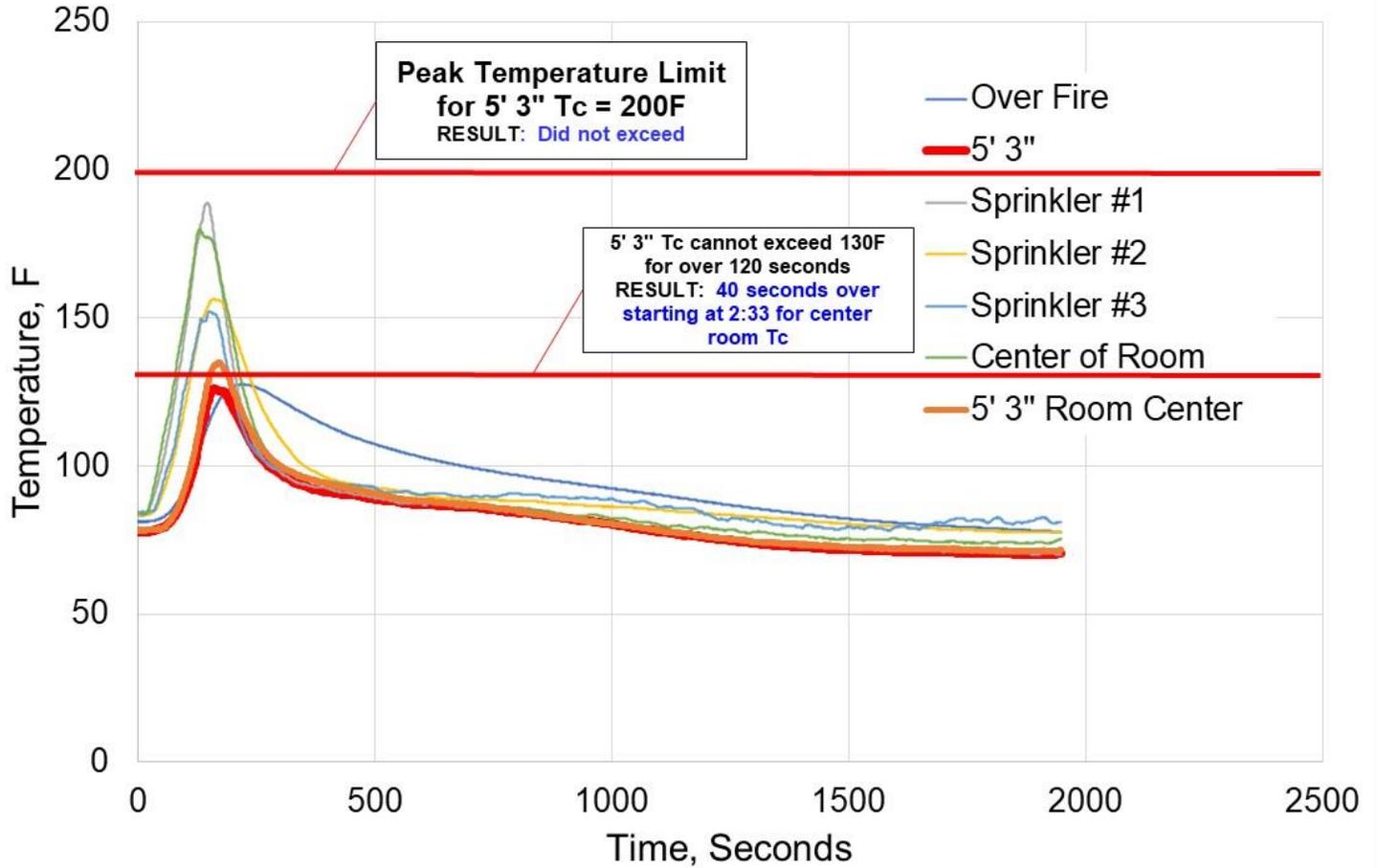
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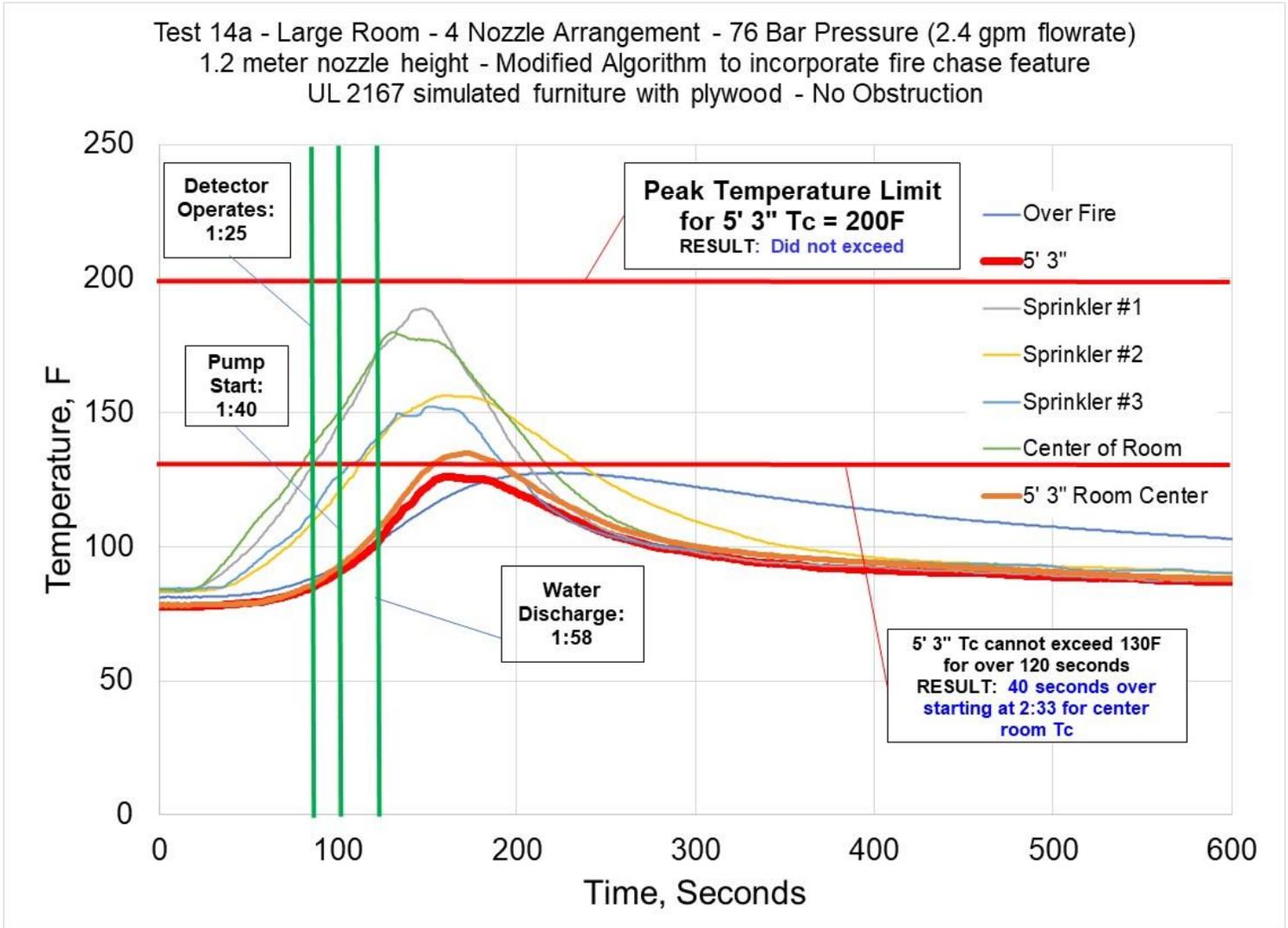
TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room				
Test Number	14		Test Date	February 6, 2023
Fire Test Code	02062301		Fuel Package	UL 2167 simulated furniture with plywood
Tested per section	24	Of UL 2167B	Test Room	Building 2
Test Configuration	Living Room		Room Size	18 ft. by 38 ft. by ft.
Operating Nozzle location with respect to fire	Nozzle centered on long wall closest to fire was activated.		Algorithm Designation	v1.5_AH-0-da27e88
Obstruction Detail	Not applicable (none)		Flowing Pressure	1,100 psig
Lateral position of nozzle in room	Four Nozzle series (centered on each wall)		Nominal K-factor	0.072 gpm/psig <sup>0.5</sup>
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	47-1/4 (1.2 m) in.
<b>Event</b>		<b>Operation Sequence, Time; min:sec</b>		
Smoke detector Operation Time (nozzle scanning start time) NOTE: alarm closest to fuel package operated first		1:25		
Pump Start		1:40		
Nozzle Discharge Start		1:58		
Test Duration		31:41		
<b>NOTE: Nozzle centered on long wall closest to fire was activated.</b>		<b>Trajectory Information</b>		
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees		9		
Coanda Compensated Angle, degrees		29		
		<b>Fire Angle</b>	<b>Coanda Angle</b>	<b>Pump On</b> <b>Pump Off</b>
Fire chase feature detail		9	29	1:40    31:41
<b>Thermocouple ID#</b>	<b>Location</b>			<b>Maximum Ceiling Temperature, °F</b>
Tc #1	Above Fire Embedded in Ceiling Tile			128
Tc #2	5 ft. 3 in. above test room floor near fuel package			126
Tc #3	3 inches below Ceiling Near "First Sprinkler"			189
Tc #4	3 inches below Ceiling Near "Second Sprinkler"			156
Tc #5	3 inches below Ceiling Near "Doorway Location"			152
Tc #6	3 inches below Ceiling - Center of Room			180
Tc #7	5 ft. 3 in. above test room floor (Centered on Room)			135
<b>Thermocouple Location (ID#)</b>		<b>Temperature Criteria</b>		<b>Results</b>
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)		Cannot exceed 500°F		A
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)		Cannot exceed 200°F		A
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)		Cannot exceed 600°F		A
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)		Cannot exceed 600°F		A
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)		Cannot exceed 200°F		A
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F		Cannot exceed 130 °F for 120 seconds		A (did not exceed threshold)
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F		Cannot exceed 130 °F for 120 seconds		A (40 seconds starting at 2:33)
A - Acceptable    B - Unacceptable    N/A - Not Applicable				
Comments:				

**Residential Fire Test Data - Full Test - Test 14**

Test 14a - Large Room - 4 Nozzle Arrangement - 76 Bar Pressure (2.4 gpm flowrate)  
1.2 meter nozzle height - Modified Algorithm to incorporate fire chase feature  
UL 2167 simulated furniture with plywood - No Obstruction



**Residential Fire Test Data - Early Part of Test - Test 14**





Tested by: \_\_\_\_\_

Date \_\_\_\_\_

Printed Name

Signature

TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room				
Test Number	15		Test Date	February 7, 2023
Fire Test Code	02072301		Fuel Package	Fabricated Sofa with Plywood Wall Covering
Tested per section	24	Of UL 2167B	Test Room	Building 2
Test Configuration	Living Room		Room Size	18 ft. by 38 ft. by ft.
Operating Nozzle location with respect to fire	Nozzle centered on short wall closest to fire was activated		Algorithm Designation	v1.5_AH-0-da27e88
Obstruction Detail	0.9 m tall obstruction, as close as possible to sofa - near short wall to fuel package (1.5 m away from nozzle)		Flowing Pressure	1,100 psig
Lateral position of nozzle in room	Four Nozzle series (centered on each wall)		Nominal K-factor	0.072 gpm/psig <sup>0.5</sup>
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	47-1/4 (1.2 m) in.
Event		Operation Sequence, Time; min:sec		
Smoke detector Operation Time (nozzle scanning start time) NOTE: alarm closest to fuel package operated first		0:30		
Pump Start		1:14		
Nozzle Discharge Start		1:34		
Test Duration		31:14		
NOTE: Nozzle centered on short wall closest to fire was activated.		Trajectory Information		
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees		142		
Coanda Compensated Angle, degrees		142		
		Fire Angle	Coanda Angle	Pump On Pump Off
Fire chase feature detail		142	142	1:14 31:14
Thermocouple ID#	Location		Maximum Ceiling Temperature, °F	
Tc #1	Above Fire Embedded in Ceiling Tile		101	
Tc #2	5 ft. 3 in. above test room floor near fuel package		107	
Tc #3	3 inches below Ceiling Near "First Sprinkler"		150	
Tc #4	3 inches below Ceiling Near "Second Sprinkler"		124	
Tc #5	3 inches below Ceiling Near "Doorway Location"		129	
Tc #6	3 inches below Ceiling - Center of Room		157	
Tc #7	5 ft. 3 in. above test room floor (Centered on Room)		106	
Thermocouple Location (ID#)	Temperature Criteria		Results	
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)	Cannot exceed 500°F		A	
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)	Cannot exceed 200°F		A	
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)	Cannot exceed 600°F		A	
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)	Cannot exceed 600°F		A	
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)	Cannot exceed 200°F		A	
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F	Cannot exceed 130 °F for 120 seconds		A (did not exceed threshold)	
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F	Cannot exceed 130 °F for 120 seconds		A (did not exceed threshold)	
A - Acceptable B - Unacceptable N/A - Not Applicable				
Comments:				

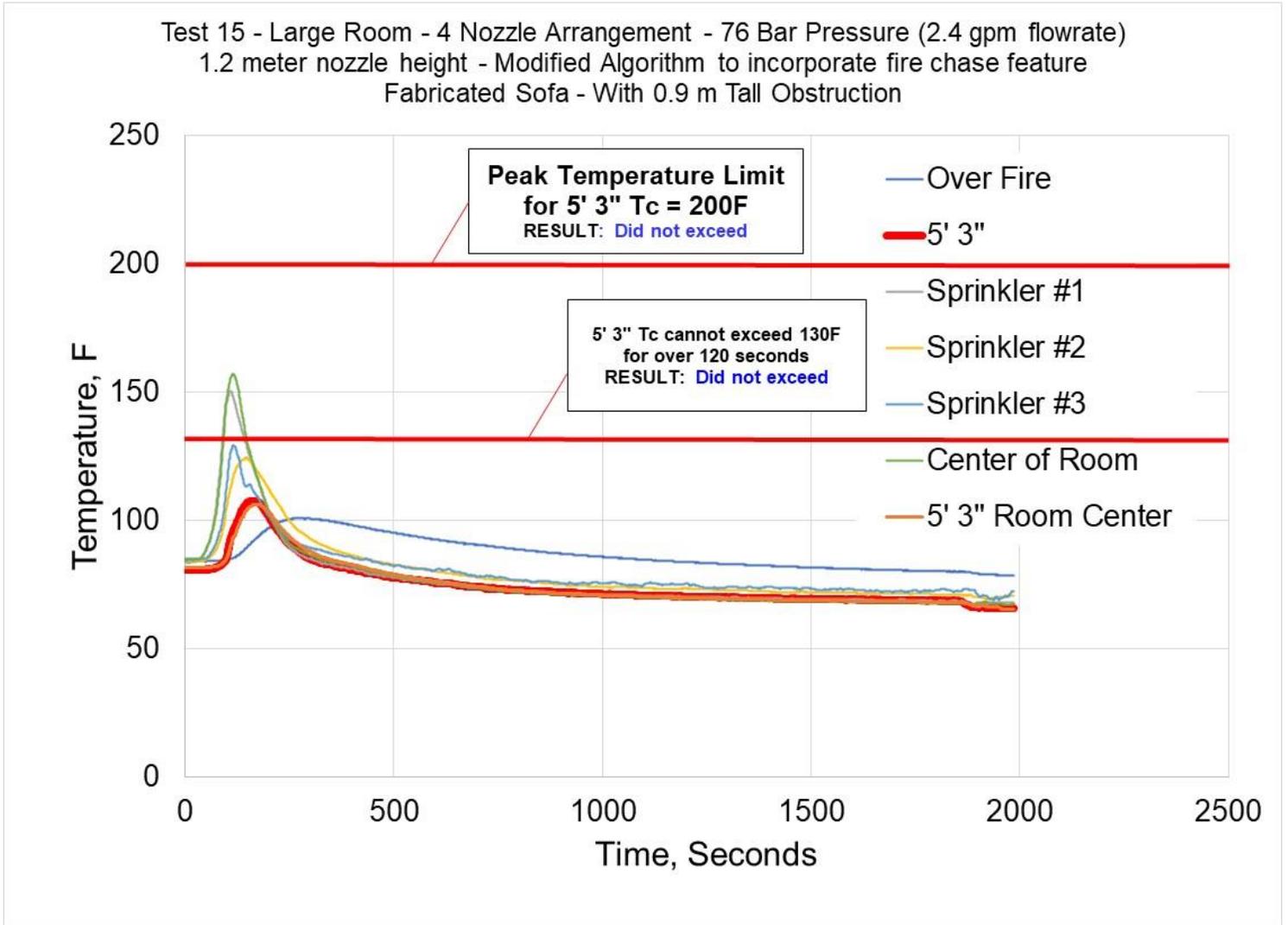
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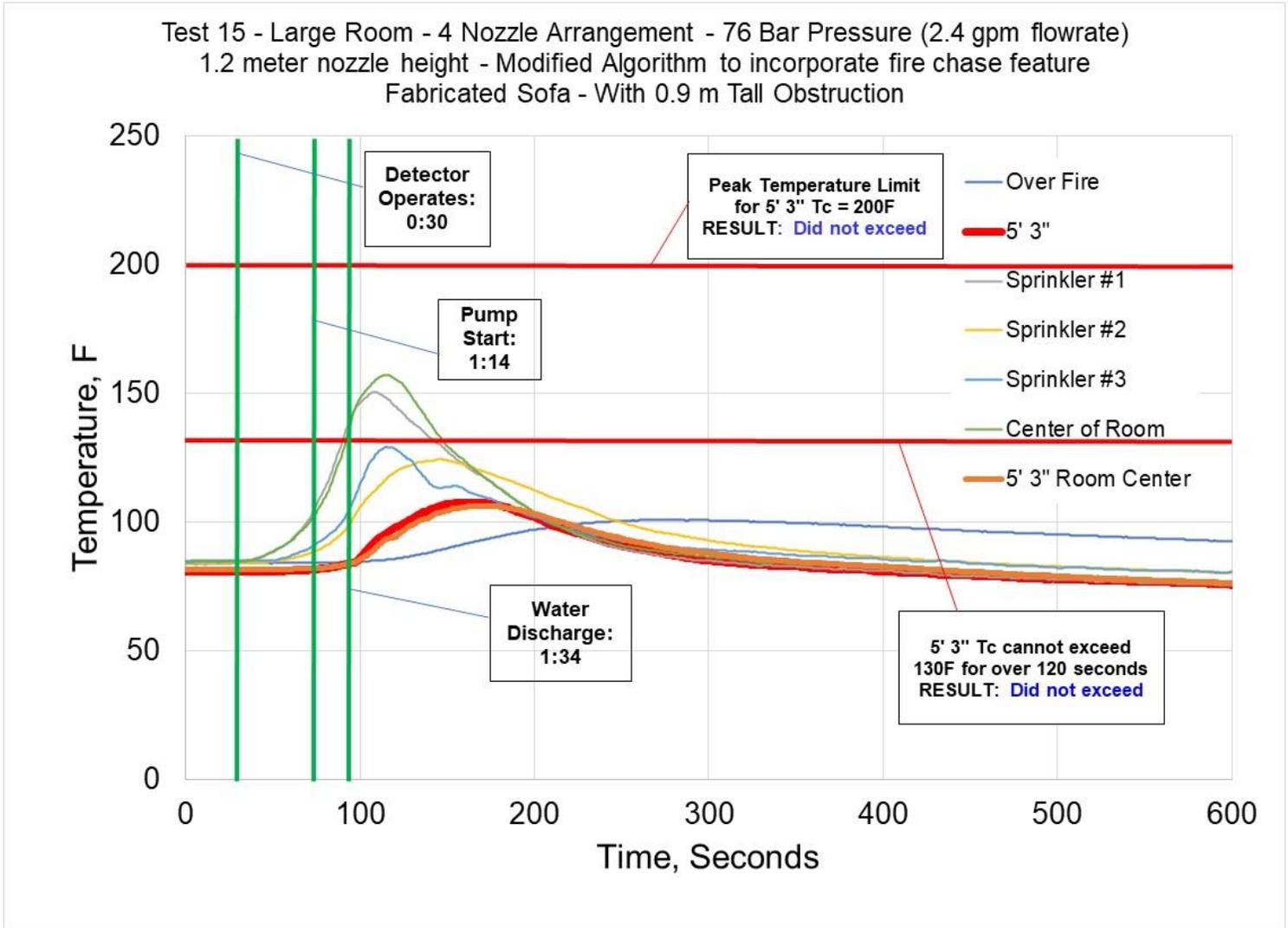
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**Residential Fire Test Data - Full Test - Test 15**



Residential Fire Test Data - Early Part of Test - Test 15



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Signature

**Residential Fire Mass List - Test 16**

<b>Residential Fire Test Mass List</b>							
<b>Test Number</b>	16						
<b>Test Date</b>	February 6, 2023						
	<b>Component Description</b>	<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>	<b>Volume Density</b>	
		pounds	inches	inches	inches	pounds/ cubic foot	
	<b>Requirement:</b>	5.5 - 7.1					
	Wood Crib	6.275	12	12	6		
	<b>Requirement:</b>						1.7 - 1.9
		<b>Mass</b>	<b>Length</b>	<b>Width</b>	<b>Height</b>		
		grams	inches	inches	inches		
	Cushion #1	1382	30	32	3	1.83	
	Cushion #2	1388	30	32	3	1.84	

Tested by: \_\_\_\_\_

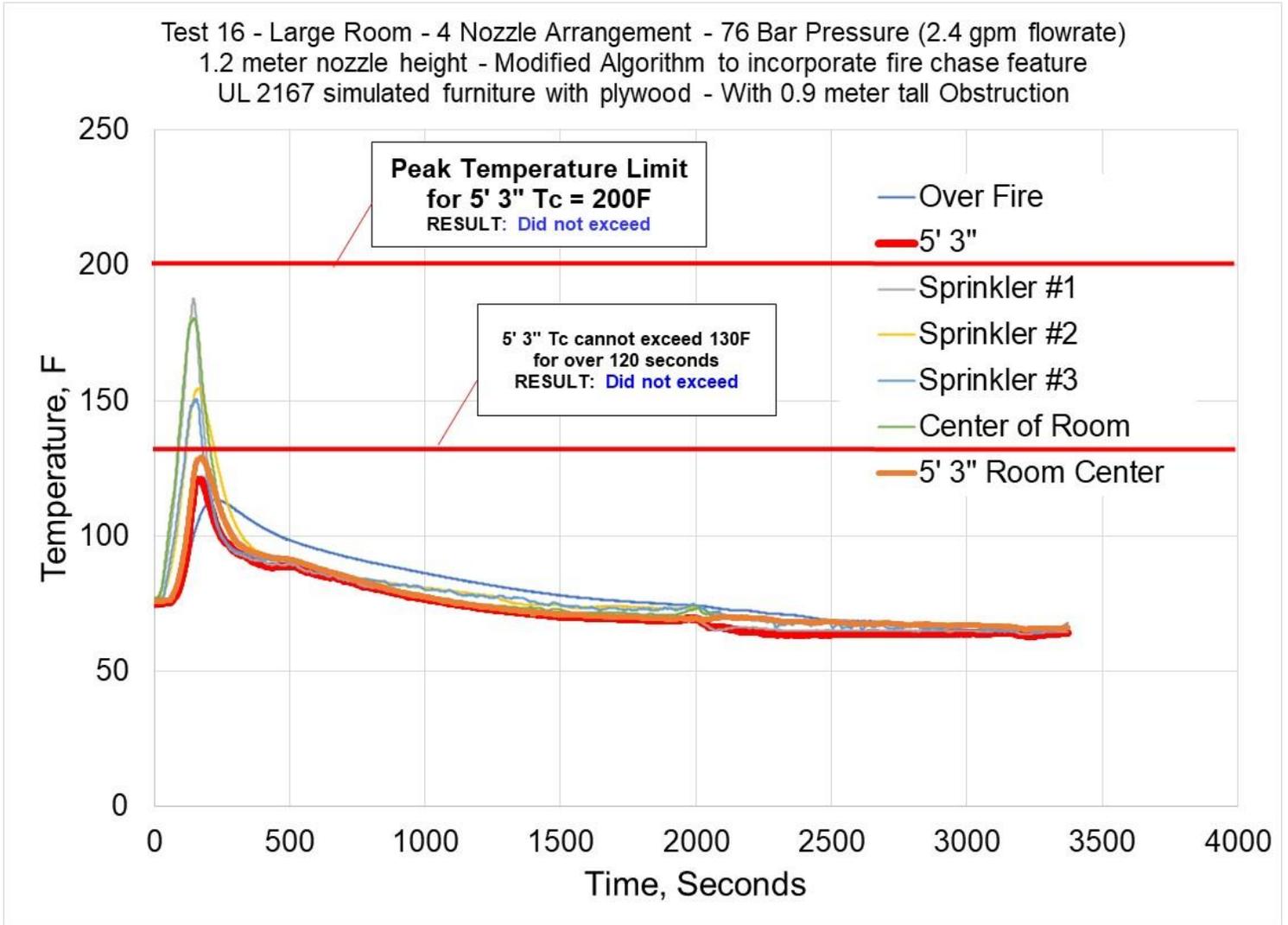
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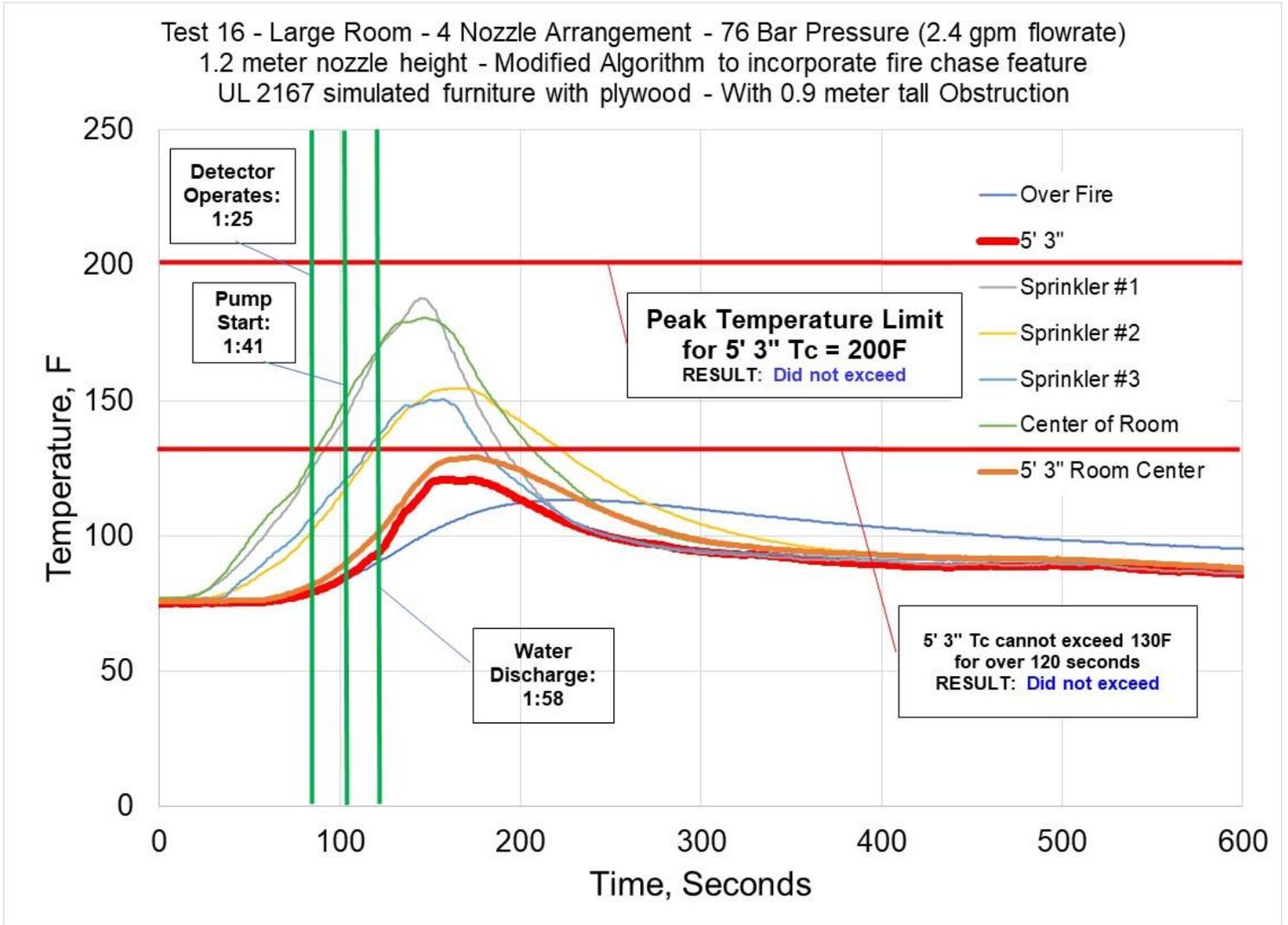
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TARGETING WATER MIST SYSTEM UNITS FOR ONE- AND TWO-FAMILY DWELLINGS FOR FIRE-PROTECTION SERVICE - Fire Tests - Nominal 8 ft. Tall Room				
Test Number	16		Test Date	February 6, 2023
Fire Test Code	02062302		Fuel Package	UL 2167 simulated furniture with plywood
Tested per section	24	Of UL 2167B	Test Room	Building 2
Test Configuration	Living Room		Room Size	18 ft. by 38 ft. by ft.
Operating Nozzle location with respect to fire	Nozzle centered on long wall closest to fire was activated		Algorithm Designation	v1.5_AH-0-da27e88
Obstruction Detail	0.9 m tall obstruction, as close as possible to long wall nozzle - near wall to fuel package (1.5 m away from nozzle)		Flowing Pressure	1,100 psig
Lateral position of nozzle in room	Four Nozzle series (centered on each wall)		Nominal K-factor	0.072 gpm/psig <sup>0.5</sup>
Nominal Flowrate	2.4	gpm	Nozzle distance from Floor	47-1/4 (1.2 m) in.
<b>Event</b>		<b>Operation Sequence, Time; min:sec</b>		
Smoke detector Operation Time (nozzle scanning start time) NOTE: alarm closest to fuel package operated first		1:25		
Pump Start		1:41		
Nozzle Discharge Start		1:58		
Test Duration		31:41		
NOTE: Nozzle centered on long wall closest to fire was activated.		<b>Trajectory Information</b>		
Angle of Nozzle's Discharge Orifice Upon Initial Water Delivery - Fire Angle, degrees		12		
Coanda Compensated Angle, degrees		29		
		Fire Angle	Coanda Angle	Pump On Pump Off
Fire chase feature detail		12	29	1:41 31:41
<b>Thermocouple ID#</b>	<b>Location</b>			<b>Maximum Ceiling Temperature, °F</b>
Tc #1	Above Fire Embedded in Ceiling Tile			113
Tc #2	5 ft. 3 in. above test room floor near fuel package			121
Tc #3	3 inches below Ceiling Near "First Sprinkler"			188
Tc #4	3 inches below Ceiling Near "Second Sprinkler"			155
Tc #5	3 inches below Ceiling Near "Doorway Location"			151
Tc #6	3 inches below Ceiling - Center of Room			180
Tc #7	5 ft. 3 in. above test room floor (Centered on Room)			129
<b>Thermocouple Location (ID#)</b>		<b>Temperature Criteria</b>		<b>Results</b>
Peak Temperature, Above Fire Embedded in Ceiling Tile, °F (Tc #1)		Cannot exceed 500°F		A
Peak Temperature, 5 ft. 3 in. above test room floor, °F (Tc #2 / Tc #7)		Cannot exceed 200°F		A
Peak Temperature, 3 inches below Ceiling Near "First Sprinkler", °F (Tc #3)		Cannot exceed 600°F		A
Peak Temperature, 3 inches below Ceiling - Center of Room, °F (Tc #6)		Cannot exceed 600°F		A
Peak Temperature, 5 ft. 3 in. above test room floor (Centered on Room), °F (Tc #7)		Cannot exceed 200°F		A
Timed Criteria; 5 ft. 3 in. above test room floor Tc #1 - Corner of Room, °F		Cannot exceed 130 °F for 120 seconds		A (did not exceed threshold)
Timed Criteria; 5 ft. 3 in. above test room floor Tc #7 - Room Center, °F		Cannot exceed 130 °F for 120 seconds		A (did not exceed threshold)
A - Acceptable B - Unacceptable N/A - Not Applicable				
Comments:				

**Residential Fire Test Data - Full Test - Test 16**



Residential Fire Test Data - Early Part of Test - Test 16



Project No. 4790418313

File EX27607

Page 93

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Date \_\_\_\_\_

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Form Page 93

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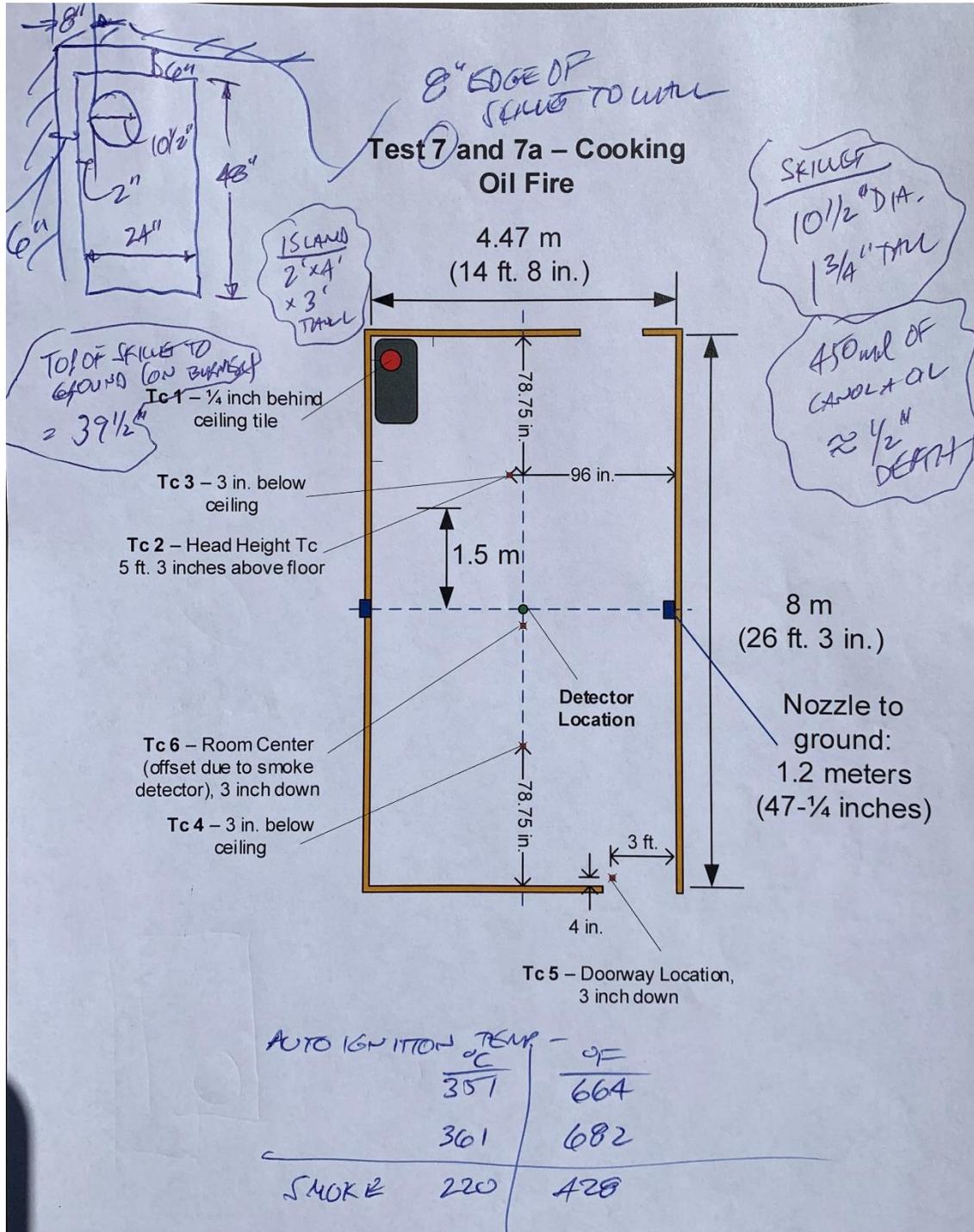
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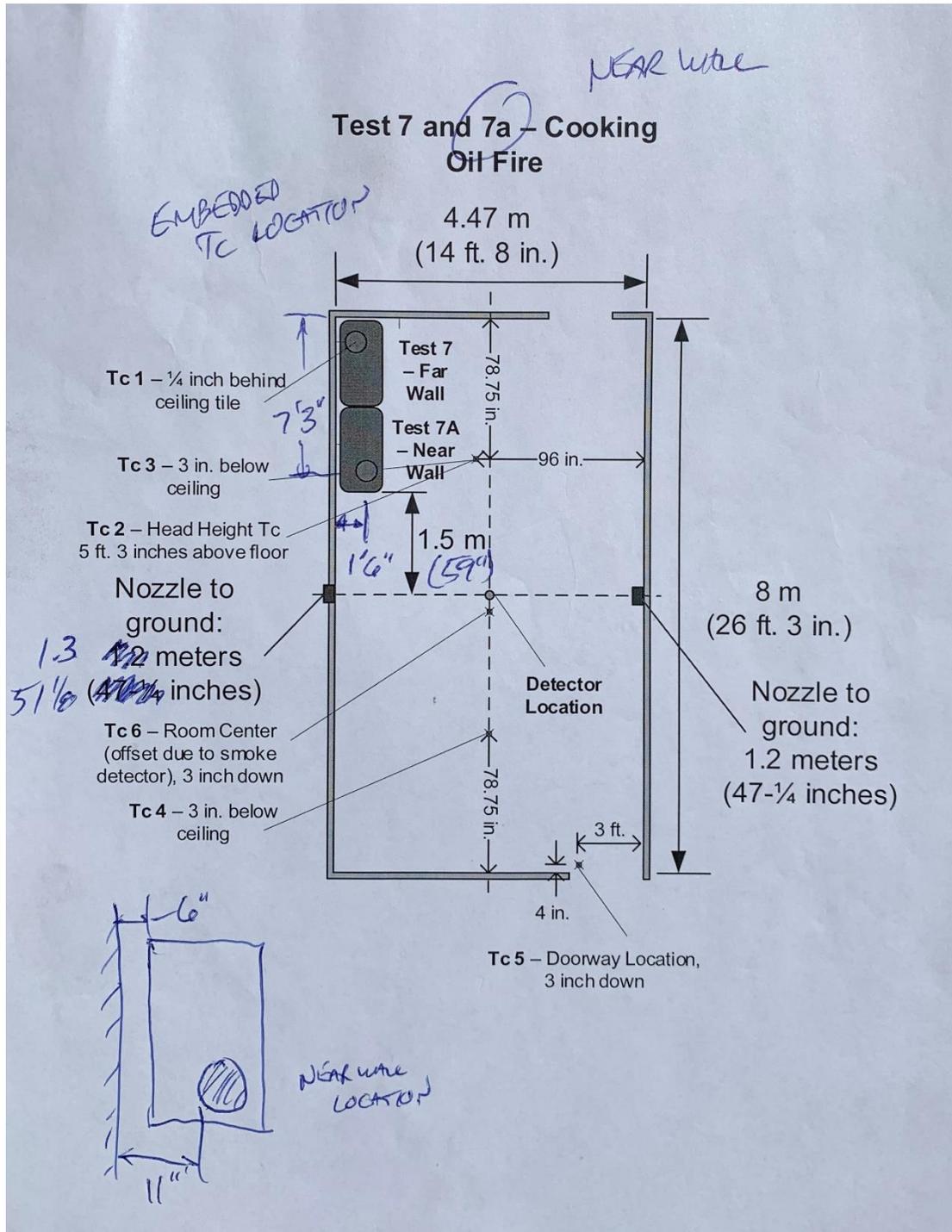
## **Annex A**

### Test Notes from Passing Tests Documented in the Main Data Sheet Package

Annex A - Test 7



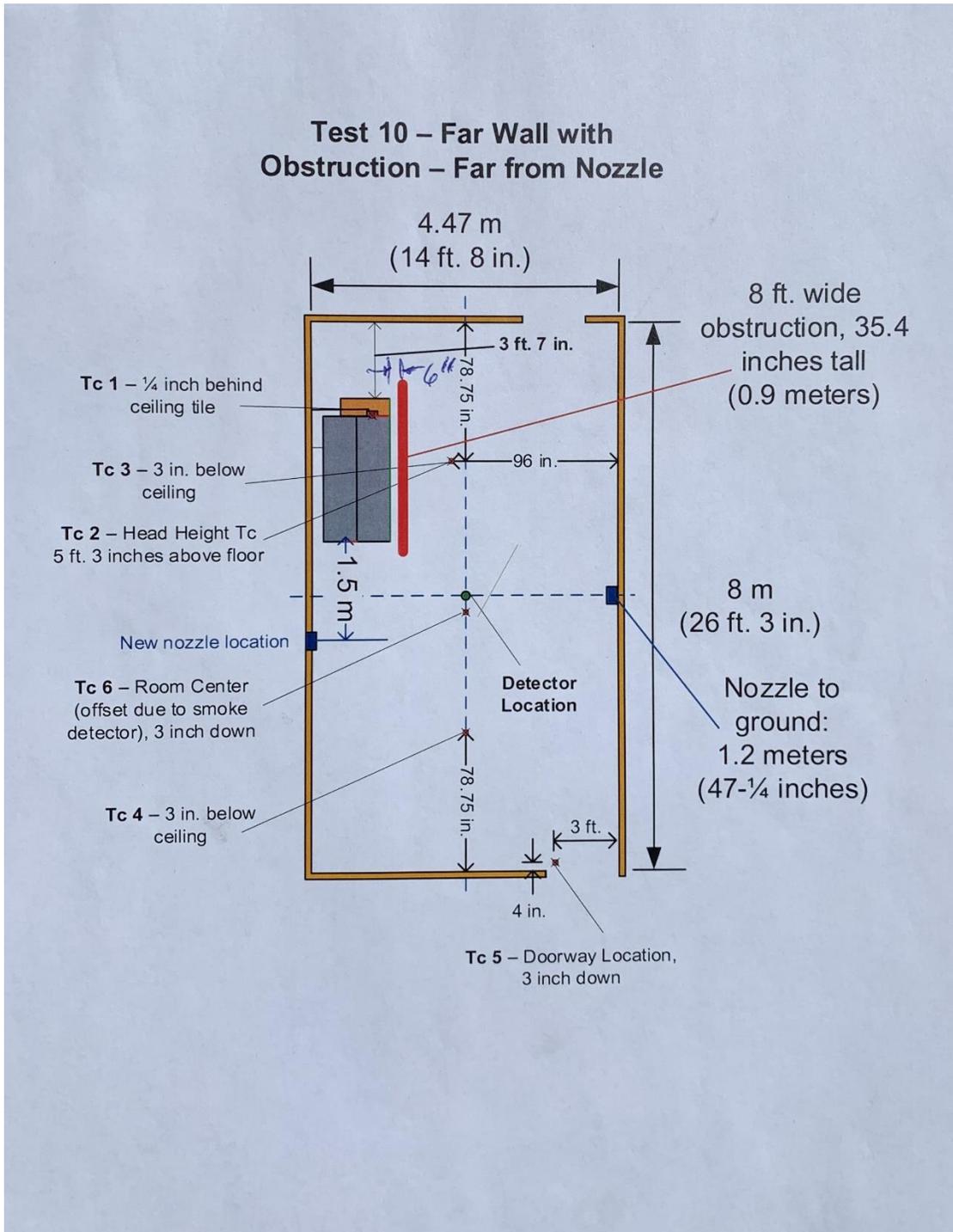
### Annex A - Test 7A







### Annex A - Test 10



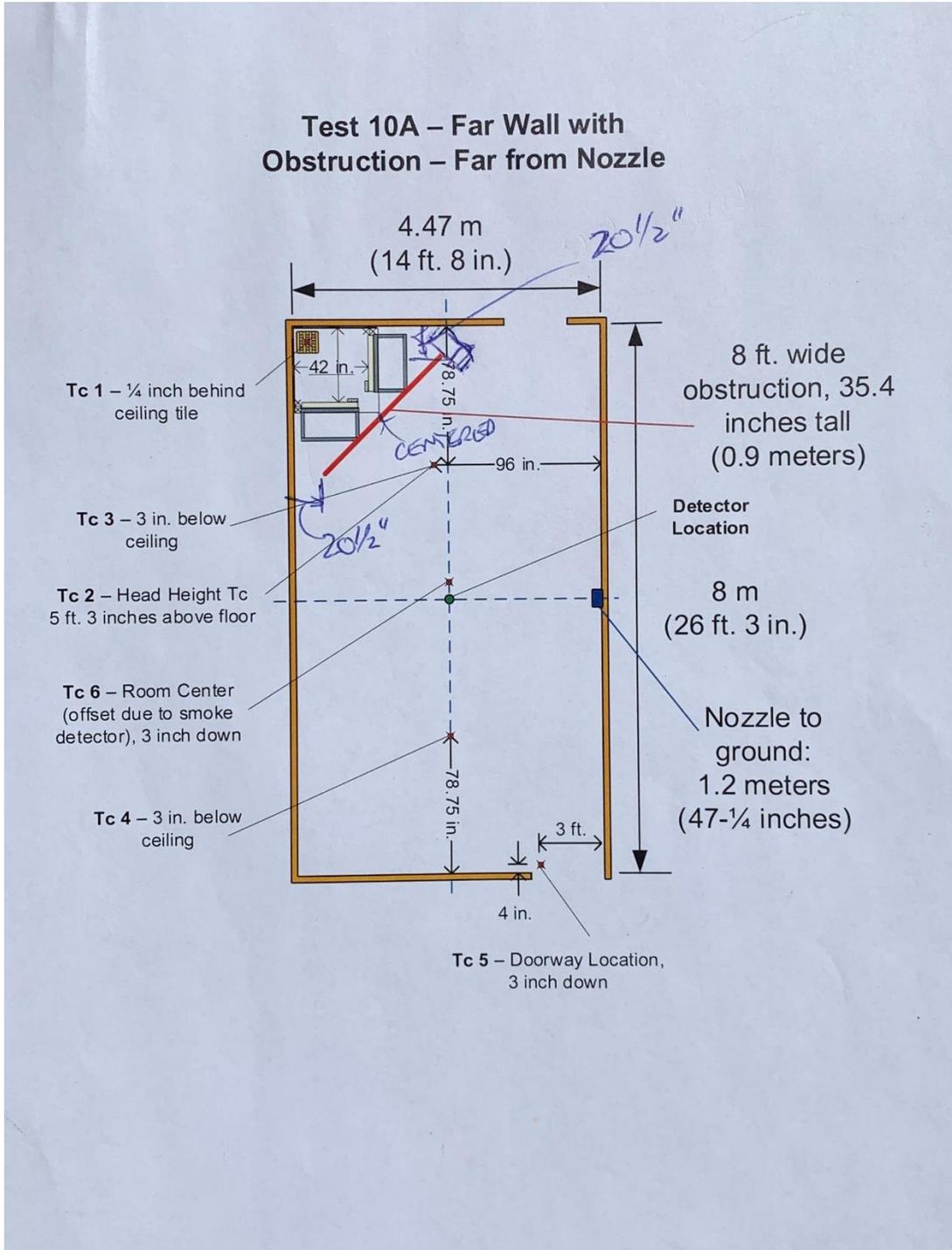
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### Annex A - Test 10A



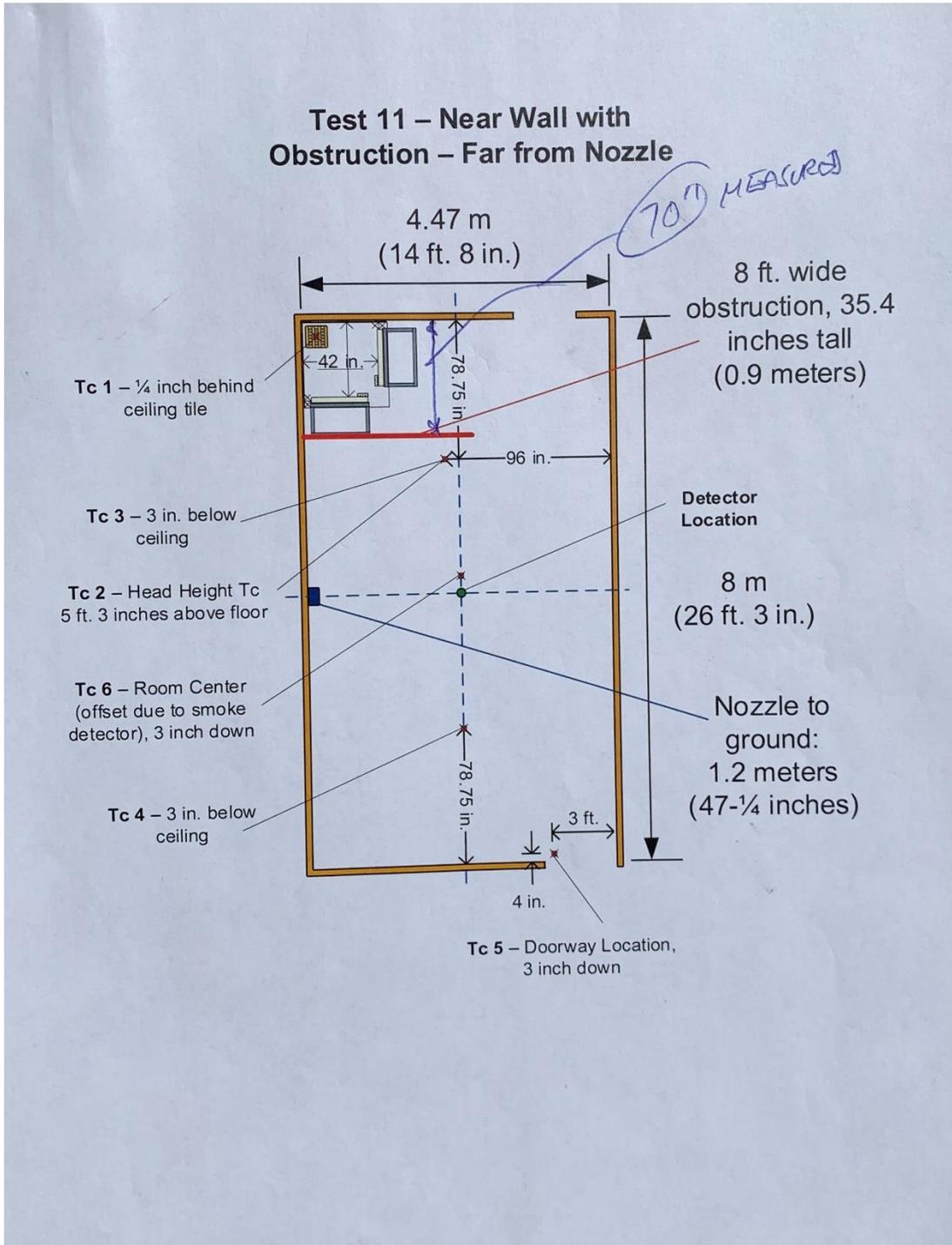
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### Annex A - Test 11



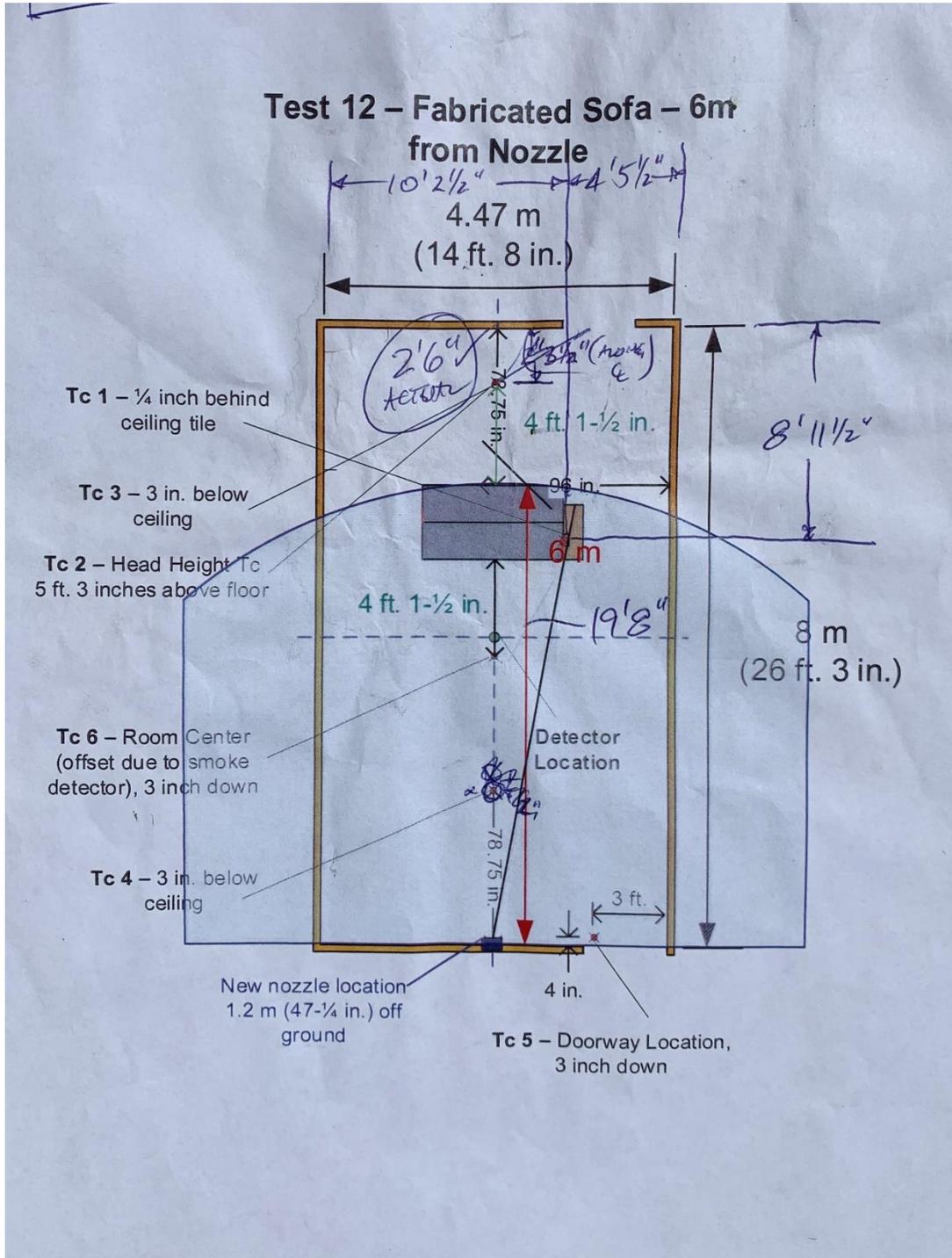
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### Annex A - Test 12

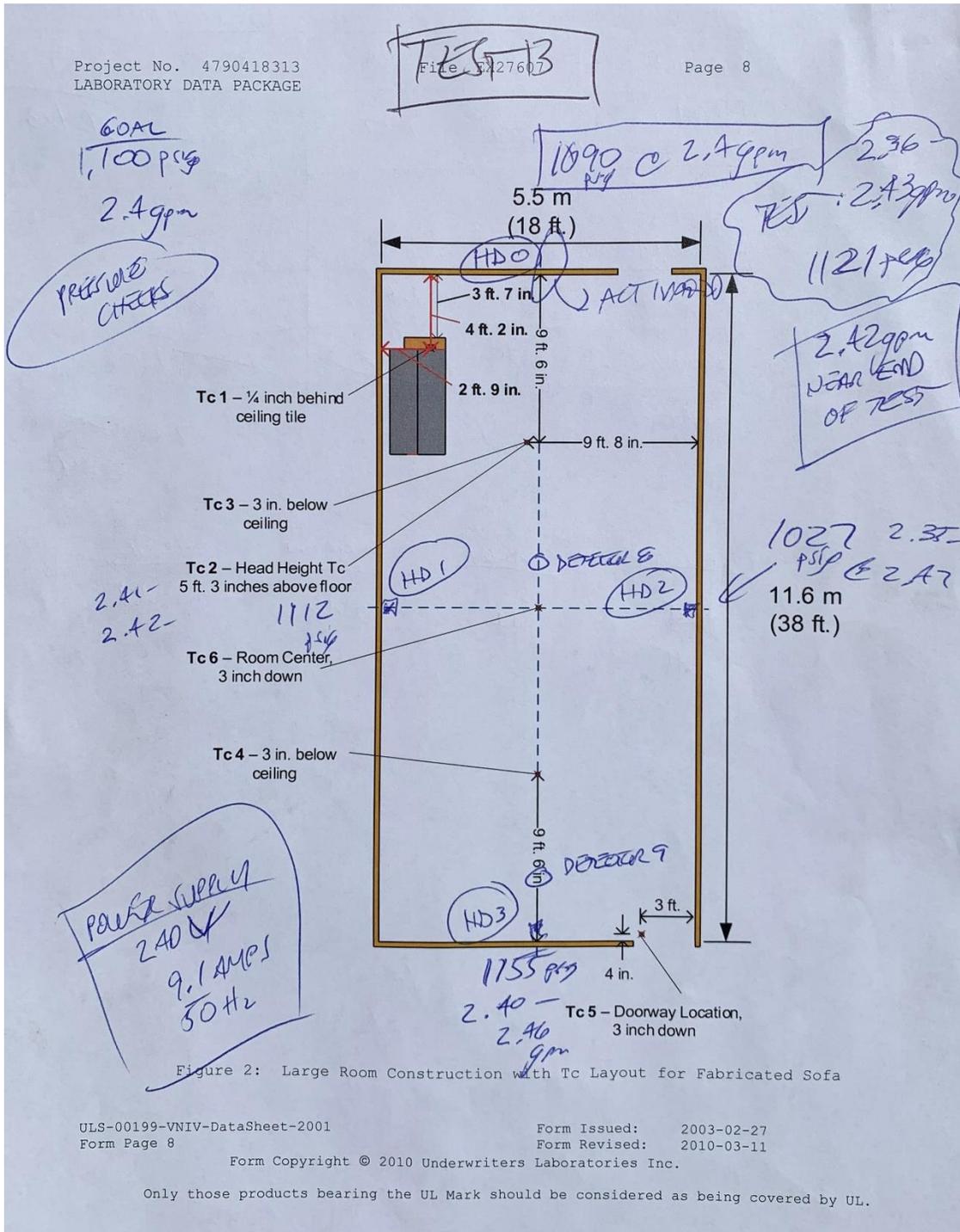


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### Annex A - Test 13



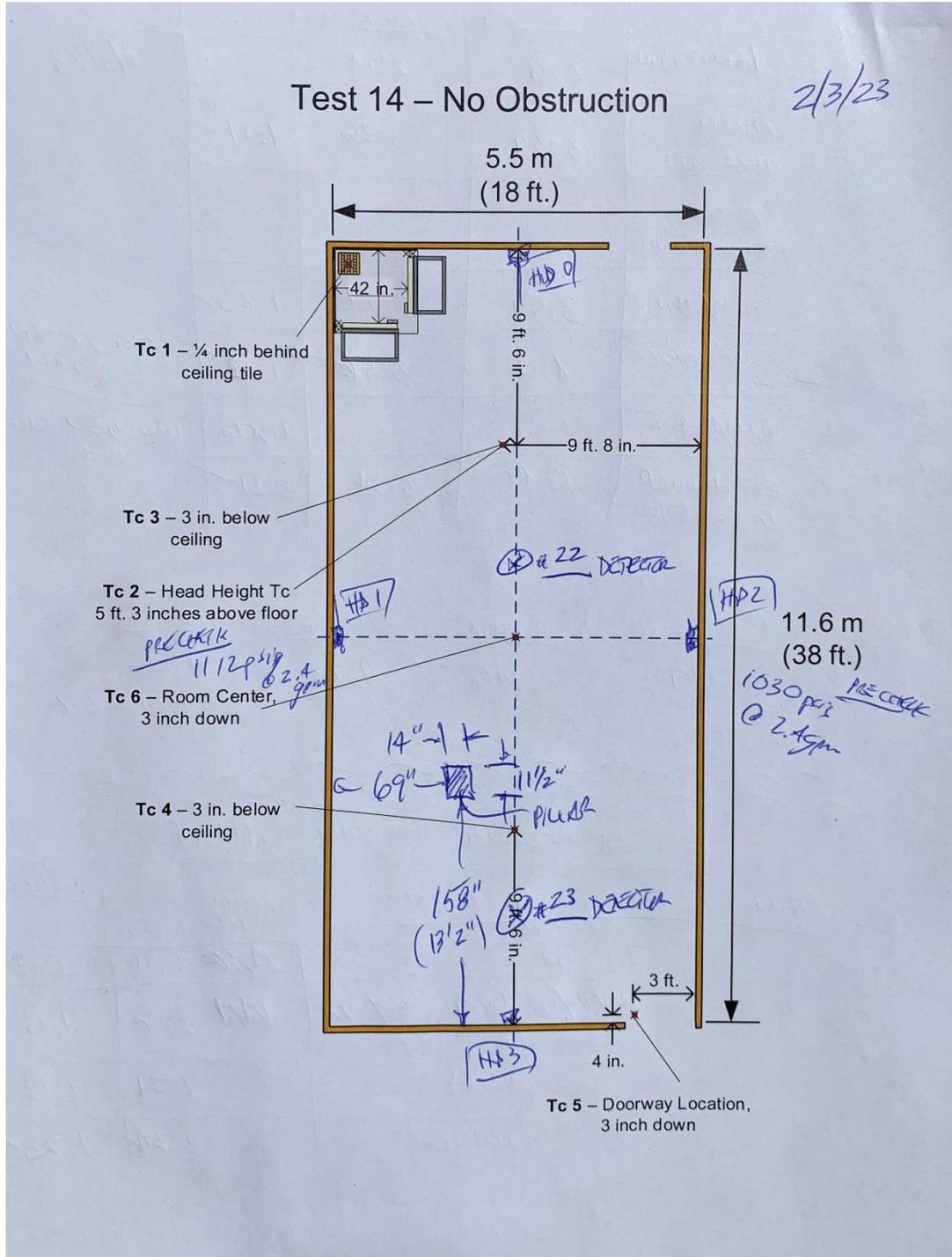
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### Annex A - Test 14 (Set-Up for 14A)



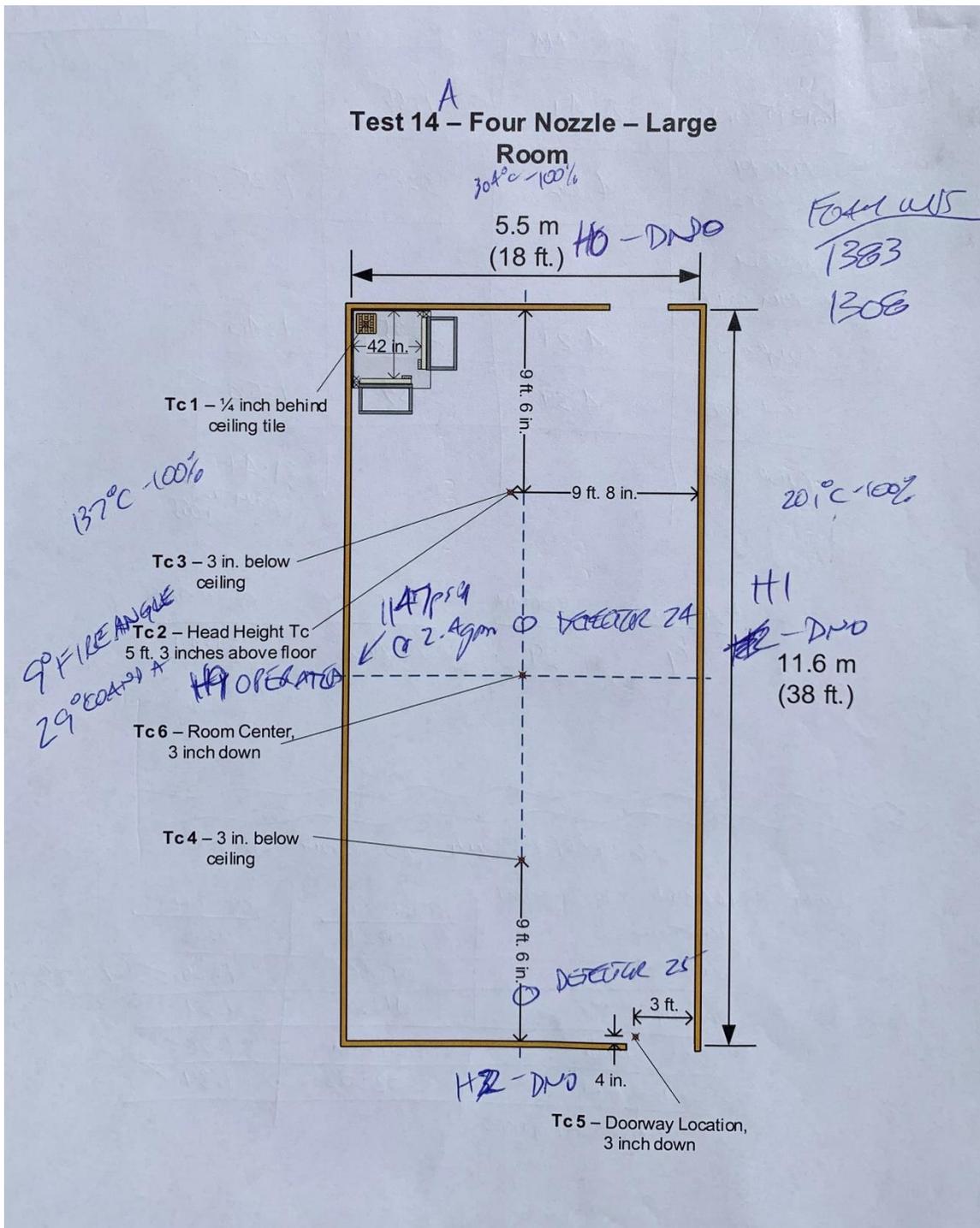
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### Annex A - Test 14A



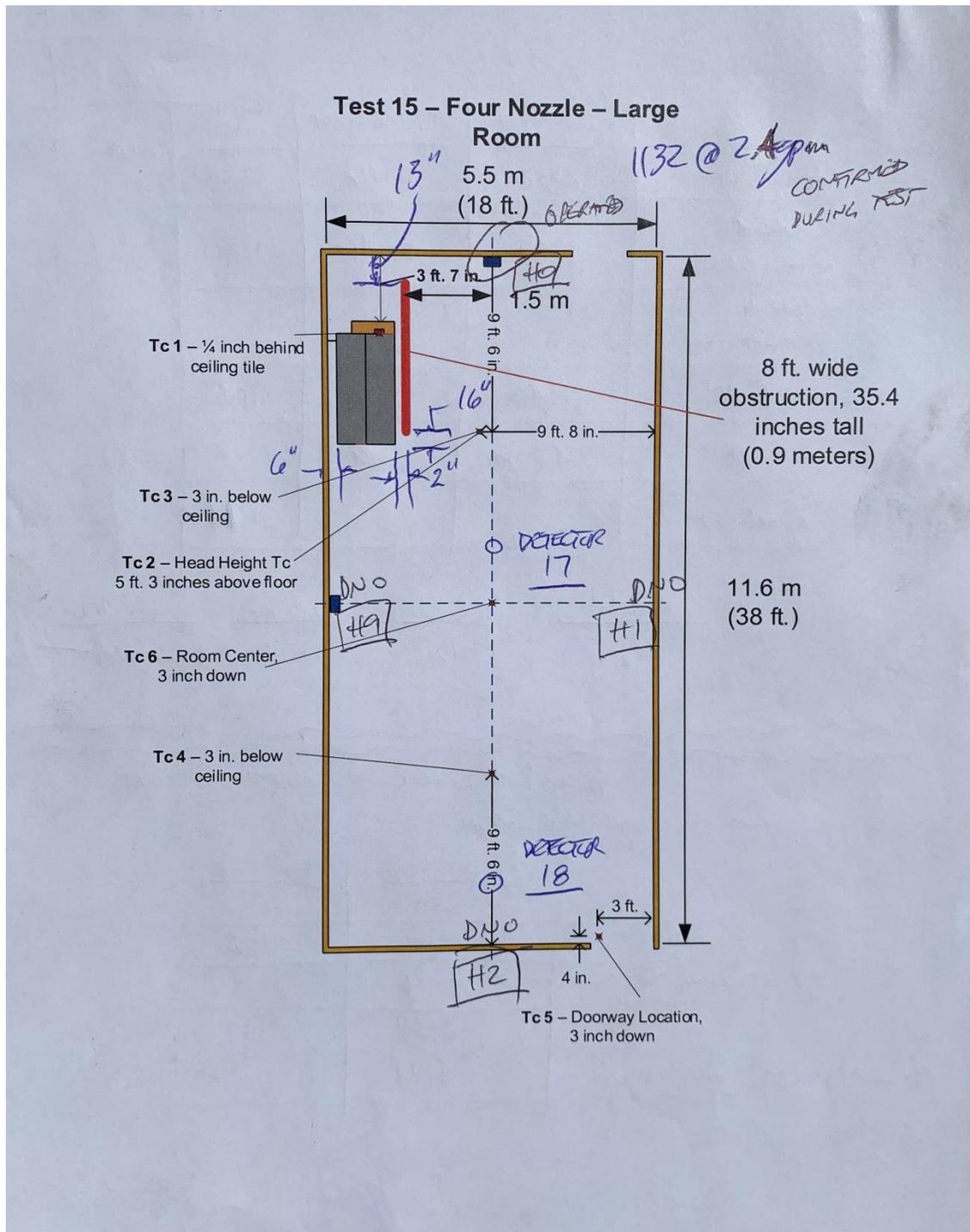
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### Annex A - Test 15



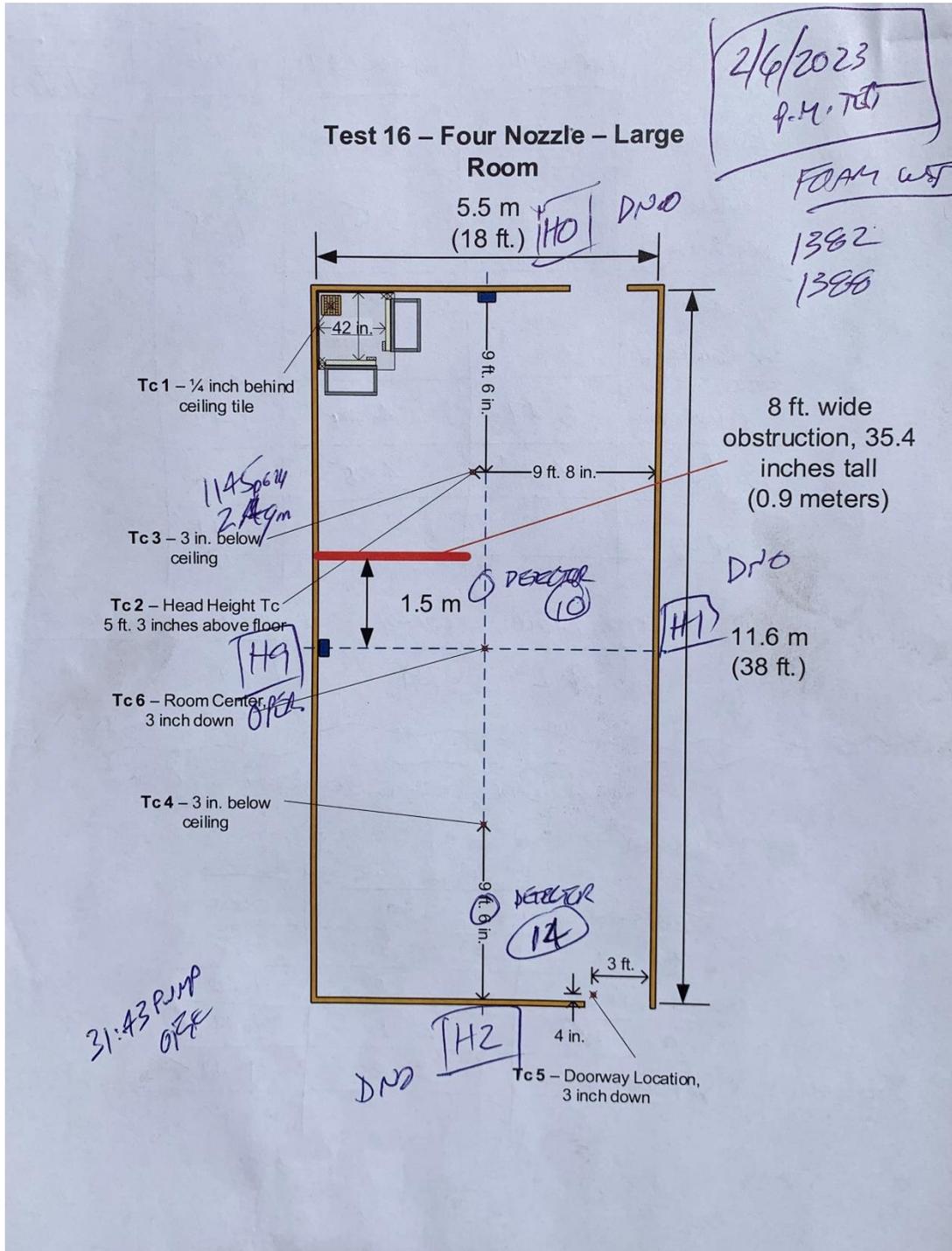
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### Annex A - Test 16



Project No. 4790418313

File EX27607

Page 108

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Form Page 108

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