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DATE: 23-Feb-09 TEST NO. 09-317 Rev 2

ARAMCO 32-SAMSS-008 TEST REPORT

Inlet Air Filtration Systems For Combustion Gas
Turbines (Revised 26 October 2005 Appendix II)

Filter Description

Manufacturer	Nordic Air/TDC Filter
Filter Model /Part Number	NA140GT
Set-Up Description	4 sets of 353 mmD x 873 mmL Cylindrical 389 Pleats
Media Content	320 ft2 per set - 1280 ft2 total, 2.8 air to cloth ratio

Test Conditions

<u>Air flow Rate</u>	3,600 ft3/min	or	6,116 m3/hr
<u>Stabilized System Resistance</u>	2.5 in. w.g.	or	623 Pascals
<u>Pressure Switch Settings</u>			
High Set point	N/A in. w.g.	or	N/A Pascals
Pulsing	Set at continuous, with 36 minute cycle, 11 seconds intervals between sets of cartridges being pulsed		
<u>Test Dust</u>	ARAMCO Test Dust (PTI Batch Number 10168D)		
<u>Test Dust Feed Rate</u>	16.1 g/1000 ft3	or	0.57 g/m3
<u>Downstream Sampling Flow</u>	45.0 ft3/hour	or	1.27 m3/hr

Test Results

Initial Pressure Drop (see page 2 for graph)	
at rated flow	0.58 in. w.g. or 144 Pascals

Phase One (See pages 3 and 4 for graphs)	
time taken to stabilize at system resistance	5.48 Hours

Phase Two (See pages 5 and 6 for graphs)	
Resistance After 50 Hours cycle	3.90 w.g.

Phase Three (See pages 7 and 8 for graphs)	
Dust fed to 10" pressure Drop	10,470 grams
Pulses and Time to return to stable operating dp	8 Pulses over 36 minutes

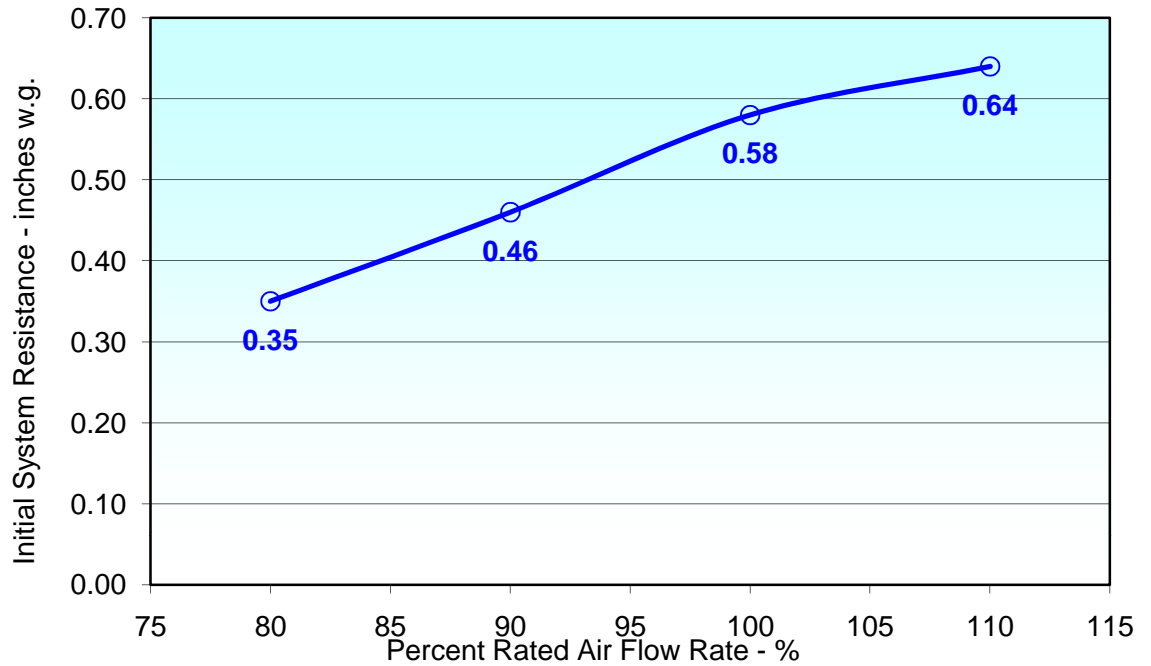
Approval

Rev 1: Manufacture changed to Nordic Air/TDC Filter

Initial Pressure Drop Determination

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Pretest - Initial Resistance


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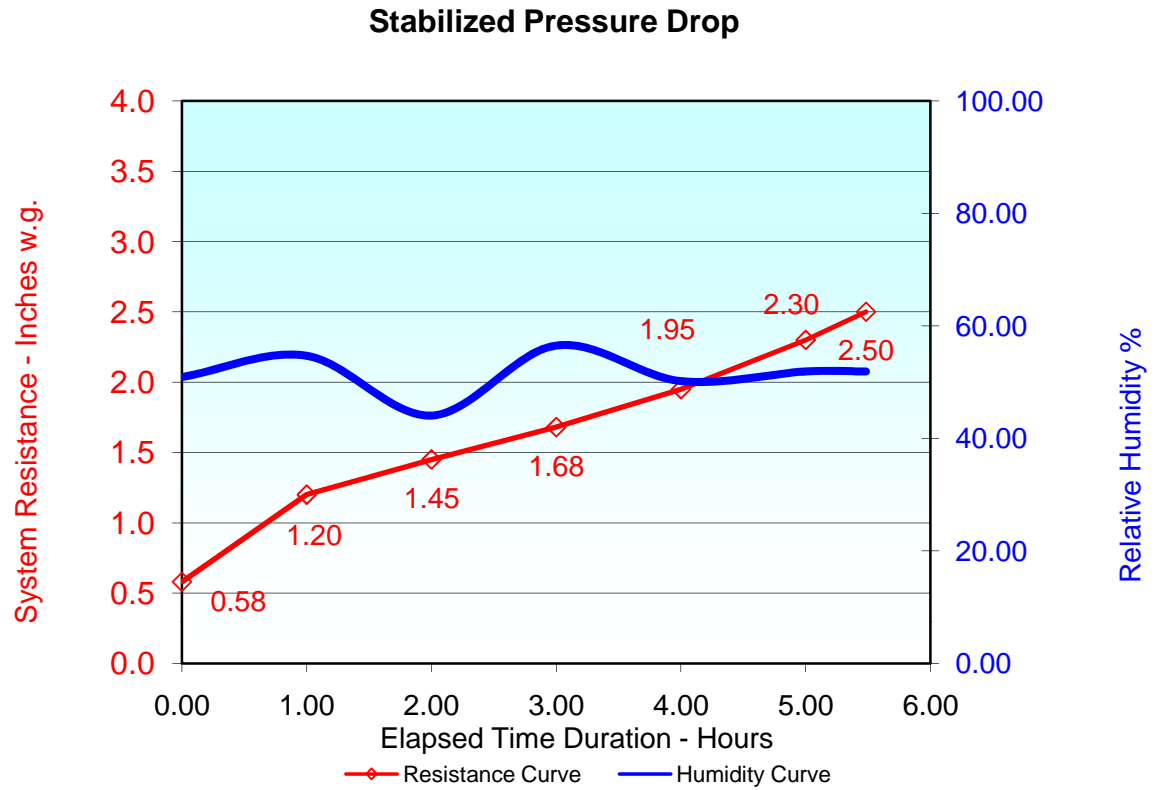
Test Supervisor
 Singer/Pfeiffer

Percent Rated Air Flow Rate	Air Flow Rate		Initial Resistance	
	ft ³ /min	m ³ /hour	inches w.g.	Pa
88%	2,880	4,893	0.35	87
90%	3,240	5,505	0.46	115
100.0%	3,600	6,116	0.58	144
110.0%	3,960	6,728	0.64	159

Engineering Approval

Test Air Flow Rate	3600 ft ³ /min
Initial System Resistance	0.58 inches Water Column
Relative Humidity	21.79 %
Temperature	74.8 Deg F
Date Performed	23-Feb-09

Phase One Resistance Testing

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Stabilized System Resistance (Pressure Drop)

2.50 inches w.g.	or	623 Pascals
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Time to Stabilized System Resistance

5.48 hours

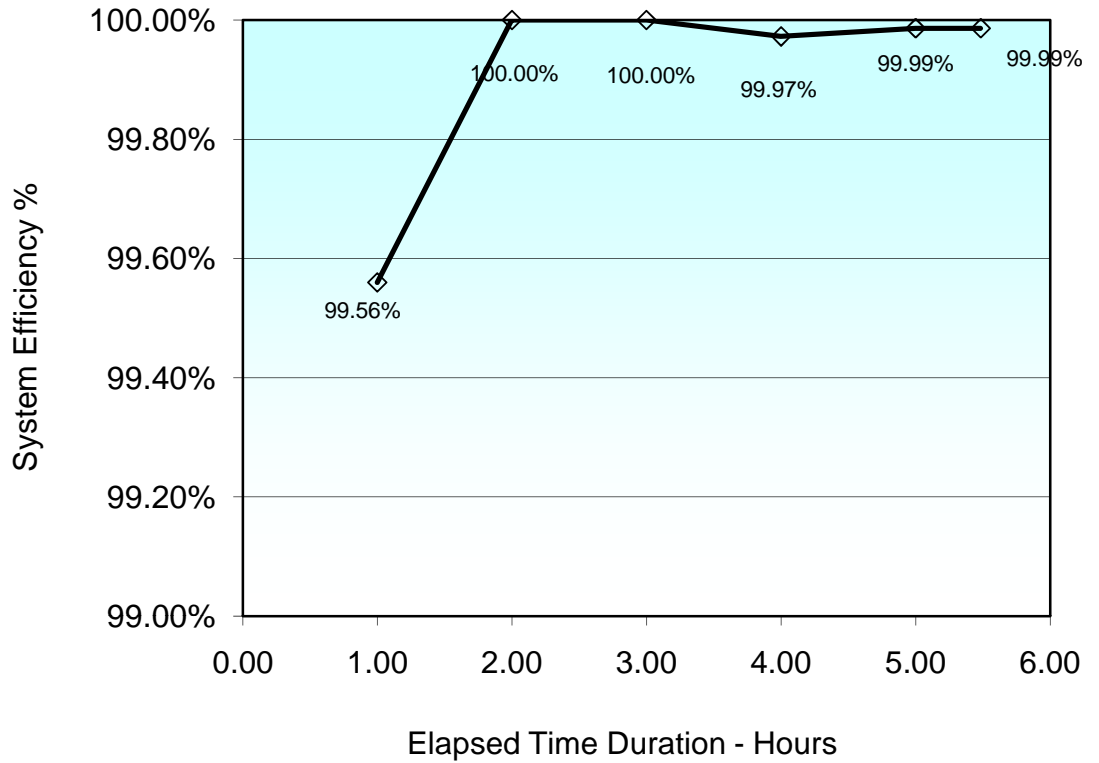
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Engineering Approval

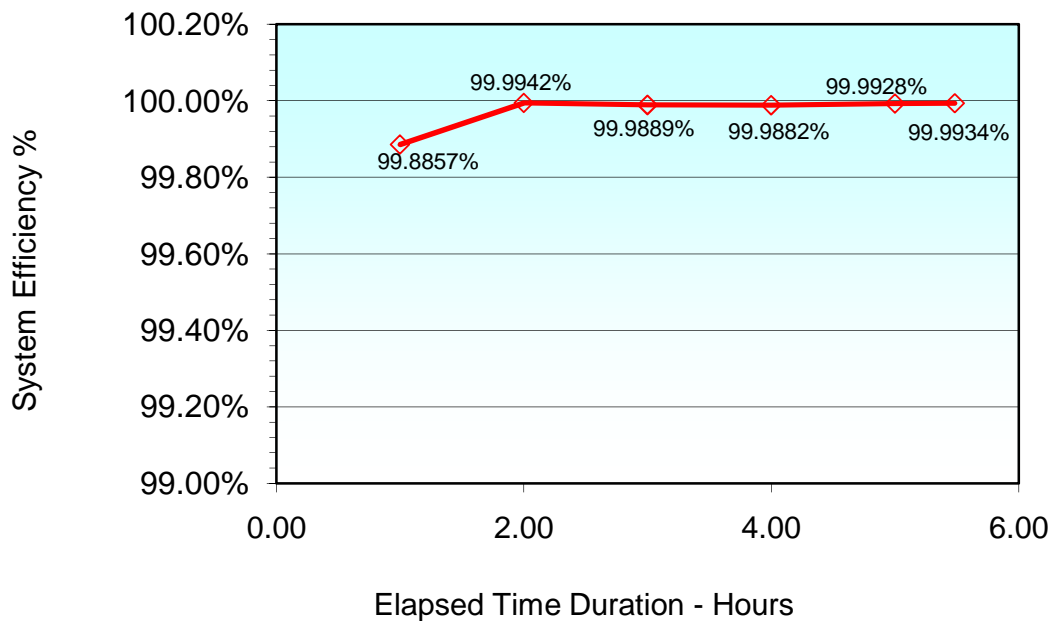
Phase One Efficiency Testing

Gravimetric Efficiency



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NaCl Efficiency

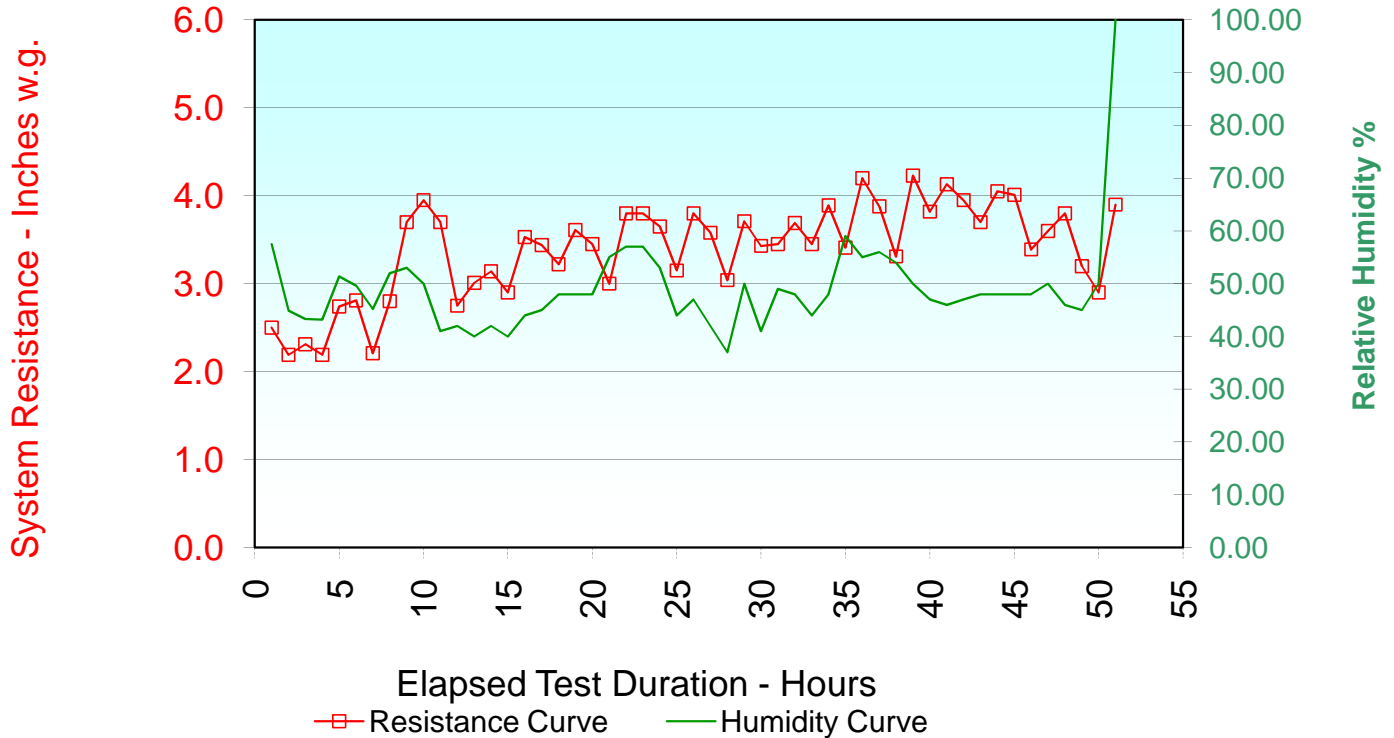


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Test Supervisor
Singer/Pfeiffer

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Phase Two Resistance Testing

Stabilized System Resistance (Pressure Drop)

 Date:
23-Feb-09

High	4.23 inches w.g.	or	1054 Pascals
Low	2.19 inches w.g.	or	546 Pascals

 Test Supervisor
Singer/Pfeiffer

Test Parameters
Total Time in Loading 50 hours

Engineering Approval

Solenoid Valve Open Time Setting 250 milliseconds

Pulse Rate Cycle 36 minutes

Pulse Header Pressure 6 bars (87 PSI)

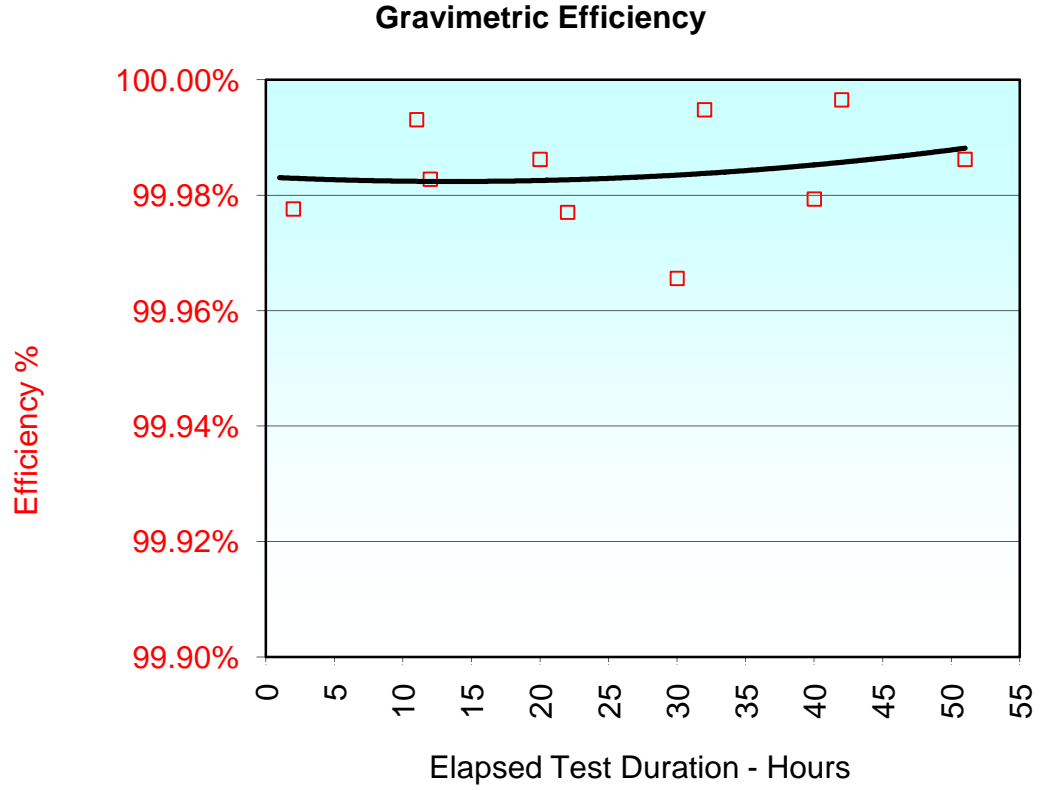
Resistance at Final Loading 3.9 w.g.

Notes:

1. Pulse rate stated is actual time cleaning both sets of filters. One set of two filters was pulsed, followed by the second set, 11 seconds later. The cycle repeats every 36 minutes.
2. The last hour of the test included introduction of liquid water spray to achieve 100% RH.

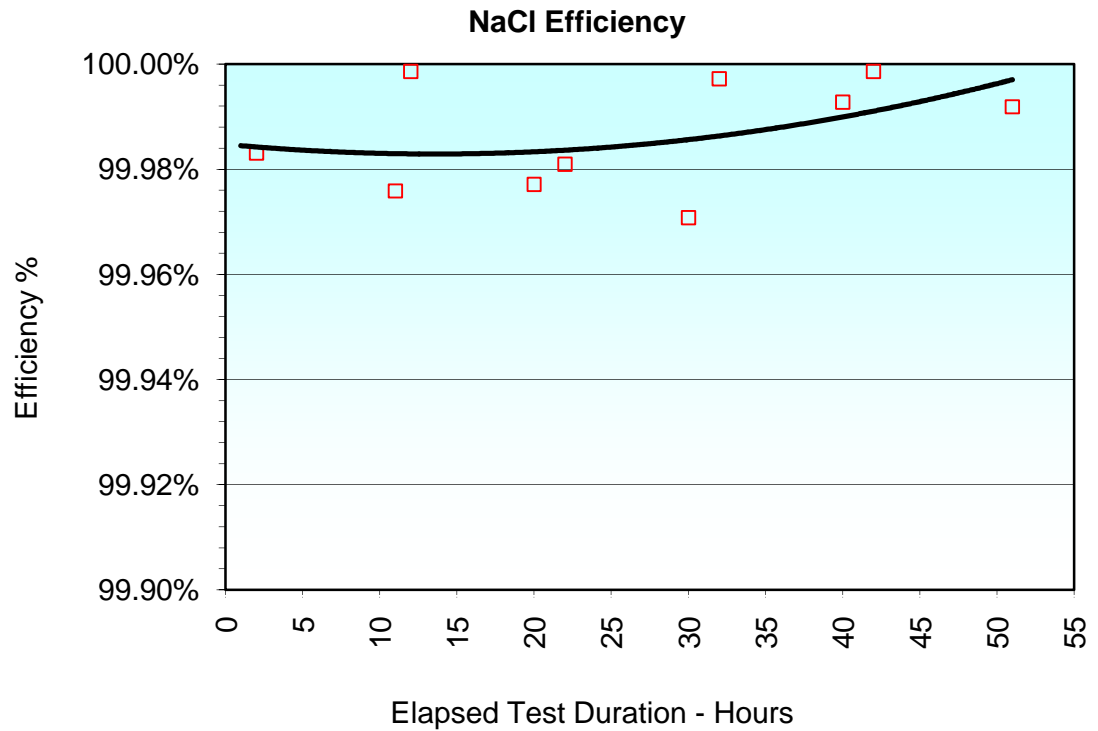
Phase Two Efficiency Testing

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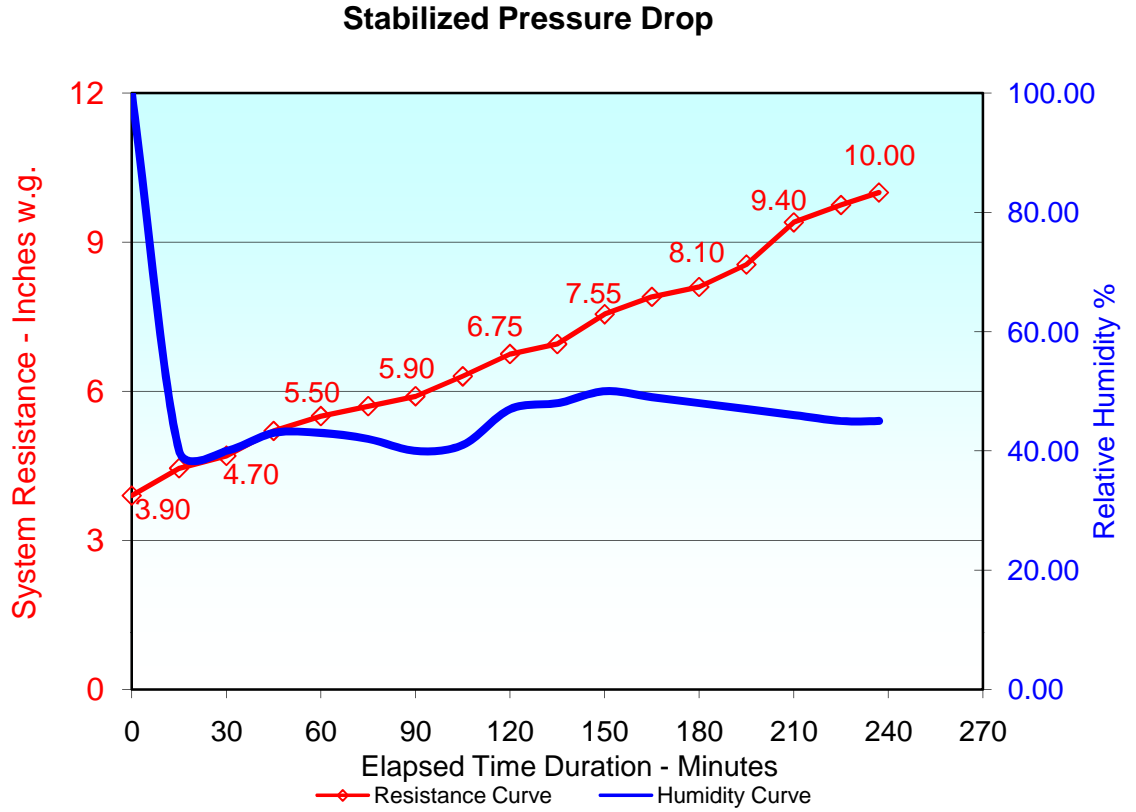
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Phase Three Resistance Test Ramp Up

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Stabilized System Resistance (Pressure Drop)

 Date:
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Initial	3.90 inches w.g.	or	971 Pascals
Final	10.00 inches w.g.	or	2491 Pascals

 Test Supervisor
 Singer/Pfeiffer

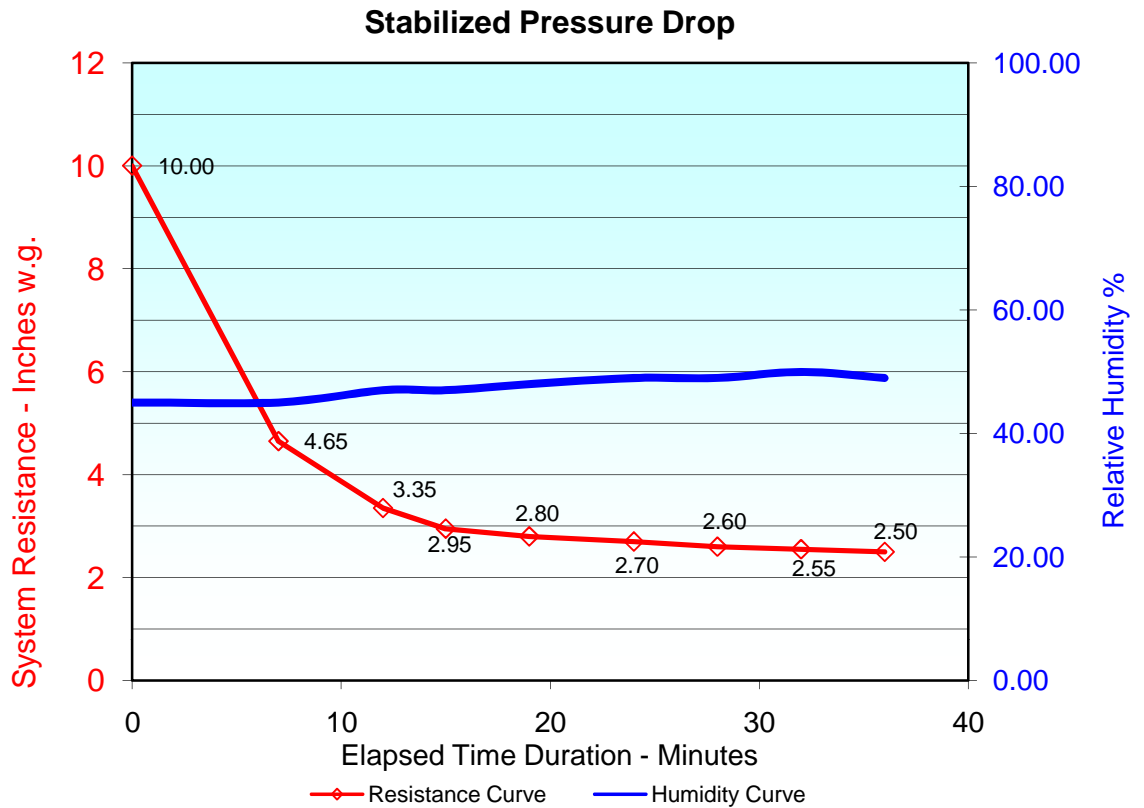
<u>Dust Fed to Final System Resistance</u>	10,470 Grams
	23.06 Pounds

Engineering Approval

<u>NaCl % during final loading</u>	99.9982%
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<u>Gravimetric% during final loading</u>	99.9862%
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Phase Three Resistance Test Pulse Down

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Stabilized System Resistance (Pressure Drop)

2.50 inches w.g.	or	623 Pascals
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Clean Back to System Resistance

Time	36 minutes
Pulses	8 pulses

Engineering Approval

<u>NaCl % at final pulse down conditions</u>	99.9839%
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<u>Gravimetric% at final pulse down condition</u>	99.8624%
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