Testing of Pre-ox PAN Calibration Materials

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Quick Review from July 2006 Meeting

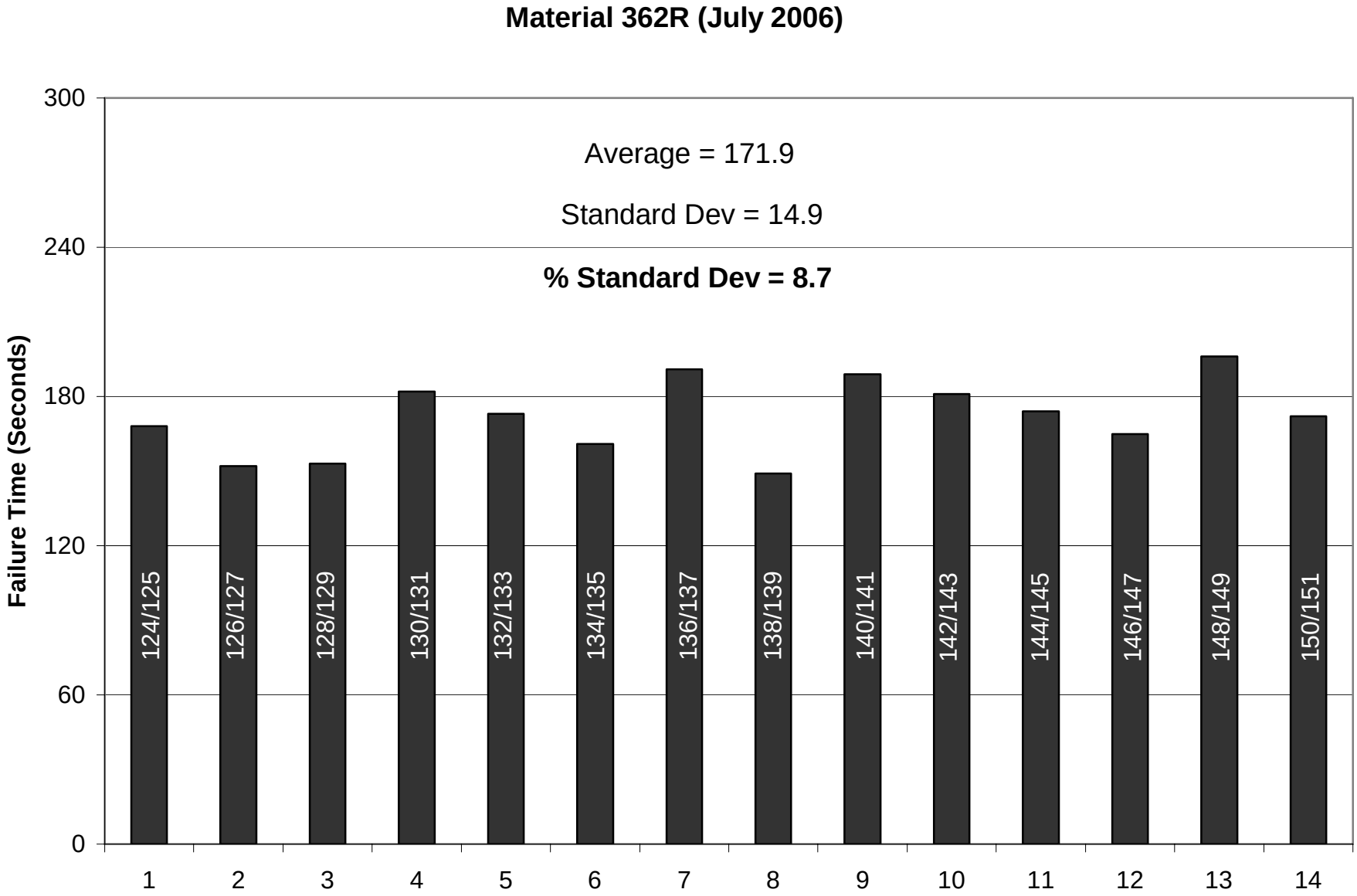
3 Styles of TexTech Felt Materials Tested at FAATC and Boeing

Purpose of Tests: To determine if a standard calibration material was available, which could be used to help identify problems in test results at any burnthrough laboratory. TexTech Industries showed an interest in developing a specific material(s) that could be manufactured under tightly controlled conditions, in order to produce a more consistent product that would fail in a specified time period.

Purpose-Built Materials Supplied by TexTech

362R: Stock material, used in previous round robins

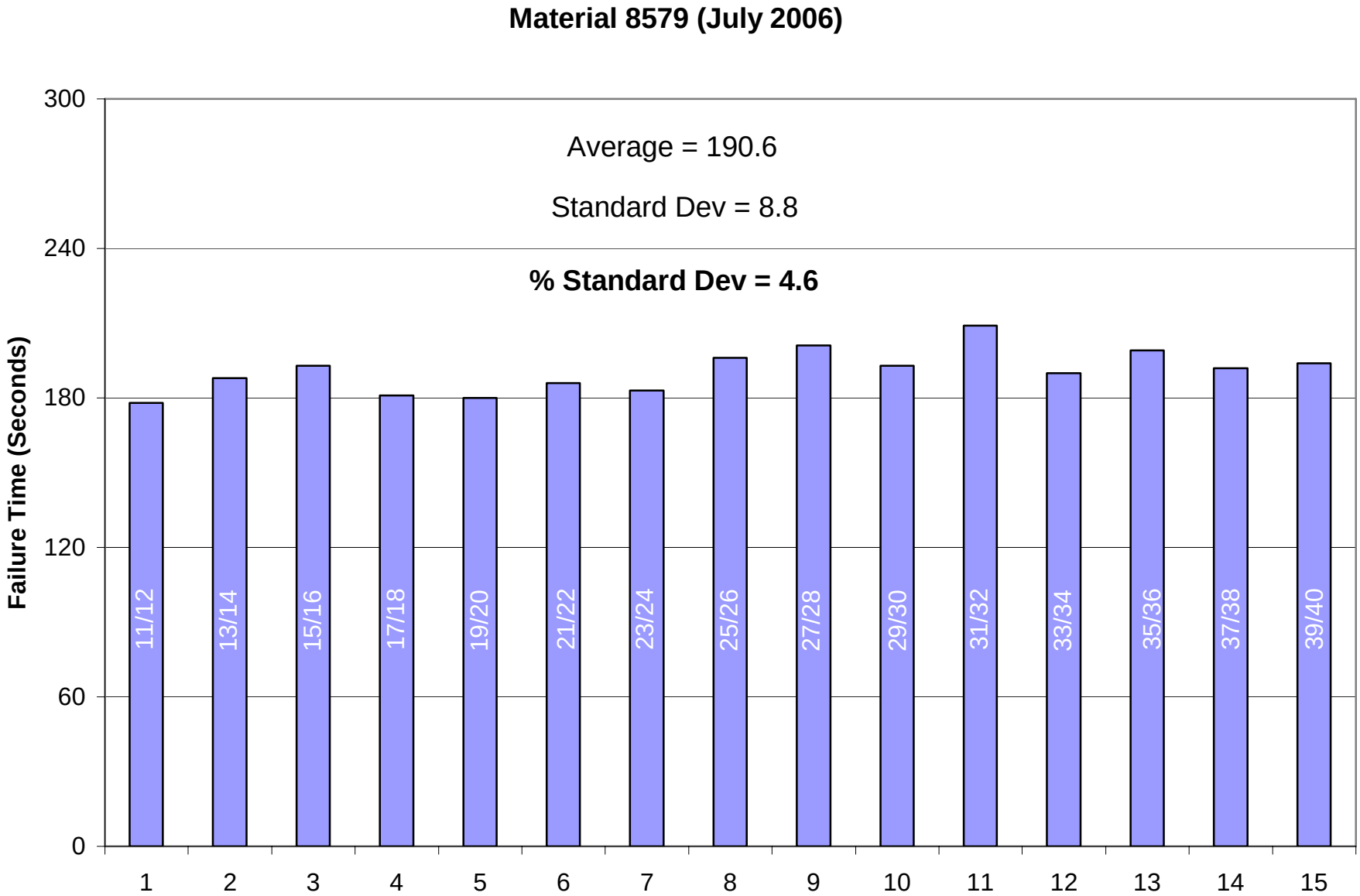
TTI produced 1 roll of 8 oz/yd^2 fabric using Zoltek fiber to simulate the performance of the roll produced in November of 2005. Although TTI used the same basic manufacturing methods, they did slow the machine down, and focused on good weight and thickness distribution for the roll. Each blanket was weighed and mapped for aerial density.


Material 362R (July 2006)
Average = 171.9
Standard Dev = 14.9
% Standard Dev = 8.7
Failure Time (Seconds)
300
240
180
120
60
0
124/125
126/127
128/129
130/131
132/133
134/135
136/137
138/139
140/141
142/143
144/145
146/147
148/149
150/151
1
2
3
4
5
6
7
8
9
10
11
12
13
14

Purpose-Built Materials Supplied by TexTech

Material 8579, slightly heavier 10 oz/yd^2

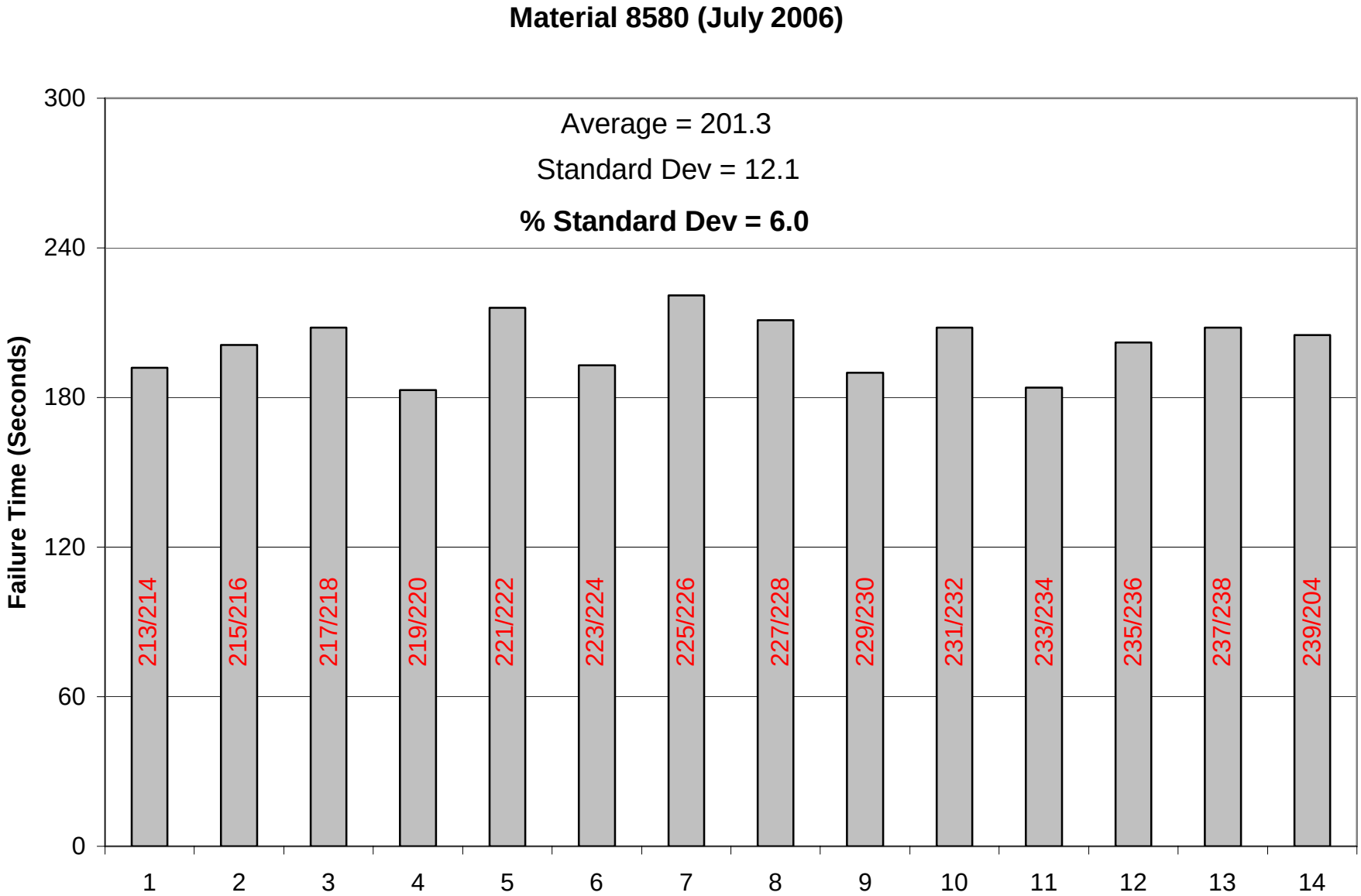
TTI produced a slightly heavier weight (10 oz/yd^2) using the Zoltex fiber with a decrease in the fabric thickness. This produced a fabric with a higher density (g/cc) than the previous trails. The trial has increased fabric layers. Again, the draft was reduced to increase the consistency and reduce any visible windows.


Material 8579 (July 2006)
Average = 190.6
Standard Dev = 8.8
% Standard Dev = 4.6
Failure Time (Seconds)
300
240
180
120
60
0
11/12
13/14
15/16
17/18
19/20
21/22
23/24
25/26
27/28
29/30
31/32
33/34
35/36
37/38
39/40
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

Purpose-Built Materials Supplied by TexTech

Material 8580, slightly heavier 10 oz/yd^2

TTI produced a slightly heavier weight (10 oz/yd^2) material using the Zoltex Fiber in order to extend the burnthrough time slightly and gain a greater understanding of the system. The trial increased the number of indivic batt layers from 15 to approximately 23 in order to increase the overall homogeneity of the material and hopefully provide a predictable burnthrough time. The draft was also reduced to "0" if possible to increase the consistency and reduce any visible windows.


Material 8580 (July 2006)
Average = 201.3
Standard Dev = 12.1
% Standard Dev = 6.0
Failure Time (Seconds)
300
240
180
120
60
0
213/214
215/216
217/218
219/220
221/222
223/224
225/226
227/228
229/230
231/232
233/234
235/236
237/238
239/204
1
2
3
4
5
6
7
8
9
10
11
12
13
14

Interim Findings from Calibration Trials (July 2006)

% Standard Deviation for Material 362R = 8.7

% Standard Deviation for Material 8579 = 4.6

% Standard Deviation for Material 8580 = 6.0

Outcome and Planned Activities from July 2006 Meeting

1. TexTech Felt Style 8579 showed most consistent results of 3 materials when tested at FAATC. Boeing results for these materials not discussed at July 2006 meeting.

2. Majority of Subgroup participants were encouraged at consistency of Style 8579; participants from Boeing requested additional trials be conducted at FAATC.

3. Additional trials to be conducted using most consistent material (8579R) from previous trial. One additional material would also be included (8611R).

4. Purpose of testing at FAATC twofold:

    a. Determine if consistency of 8579 is repeatable batch-to-batch

    b. Use test results from original burner to check correlation of new burner

October 2006 Trials at FAATC

2 styles of materials supplied by TexTech (8579R and 8611R).

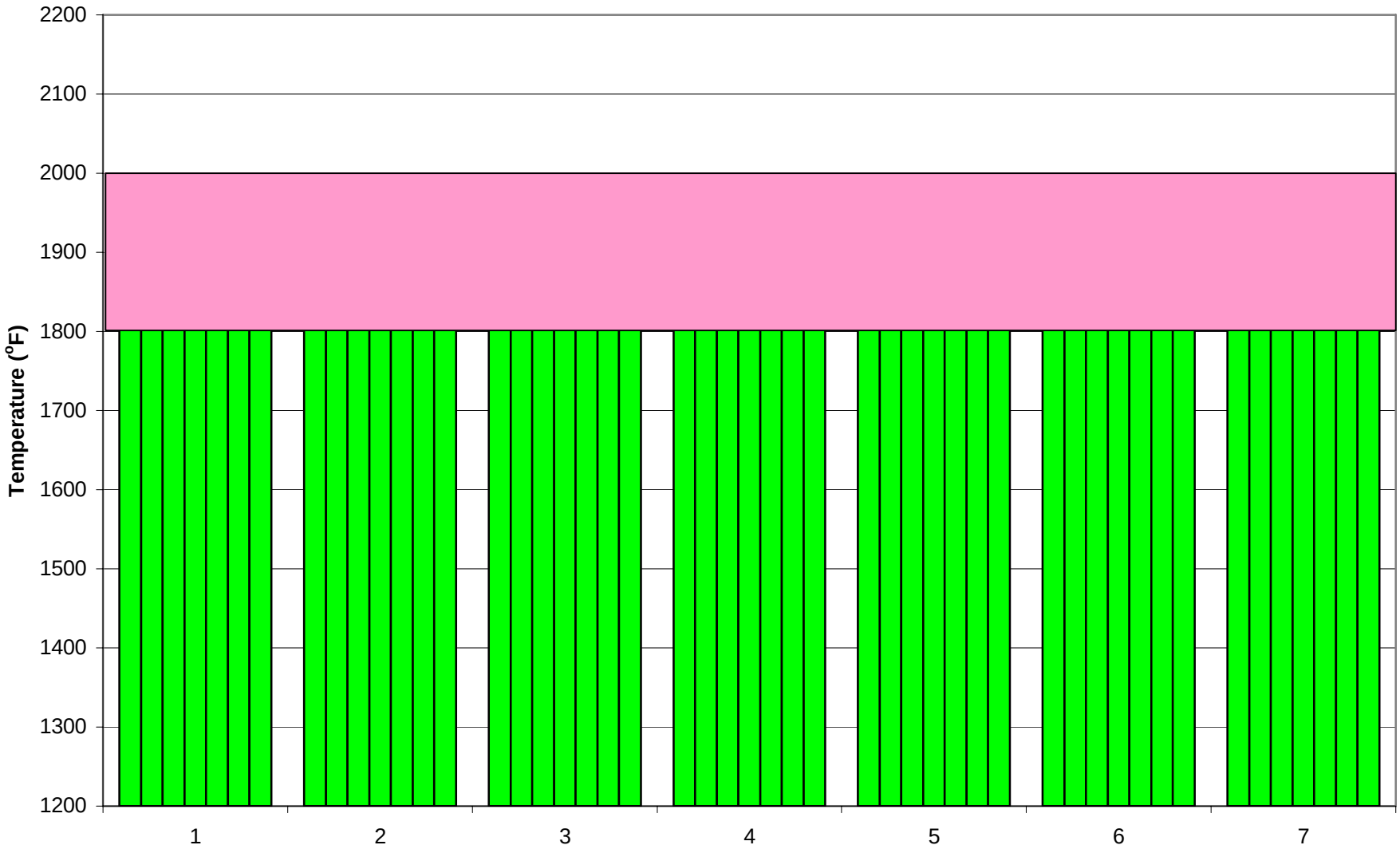
2 batches supplied for each material.

1 batch of each material tested on original FAA burner.

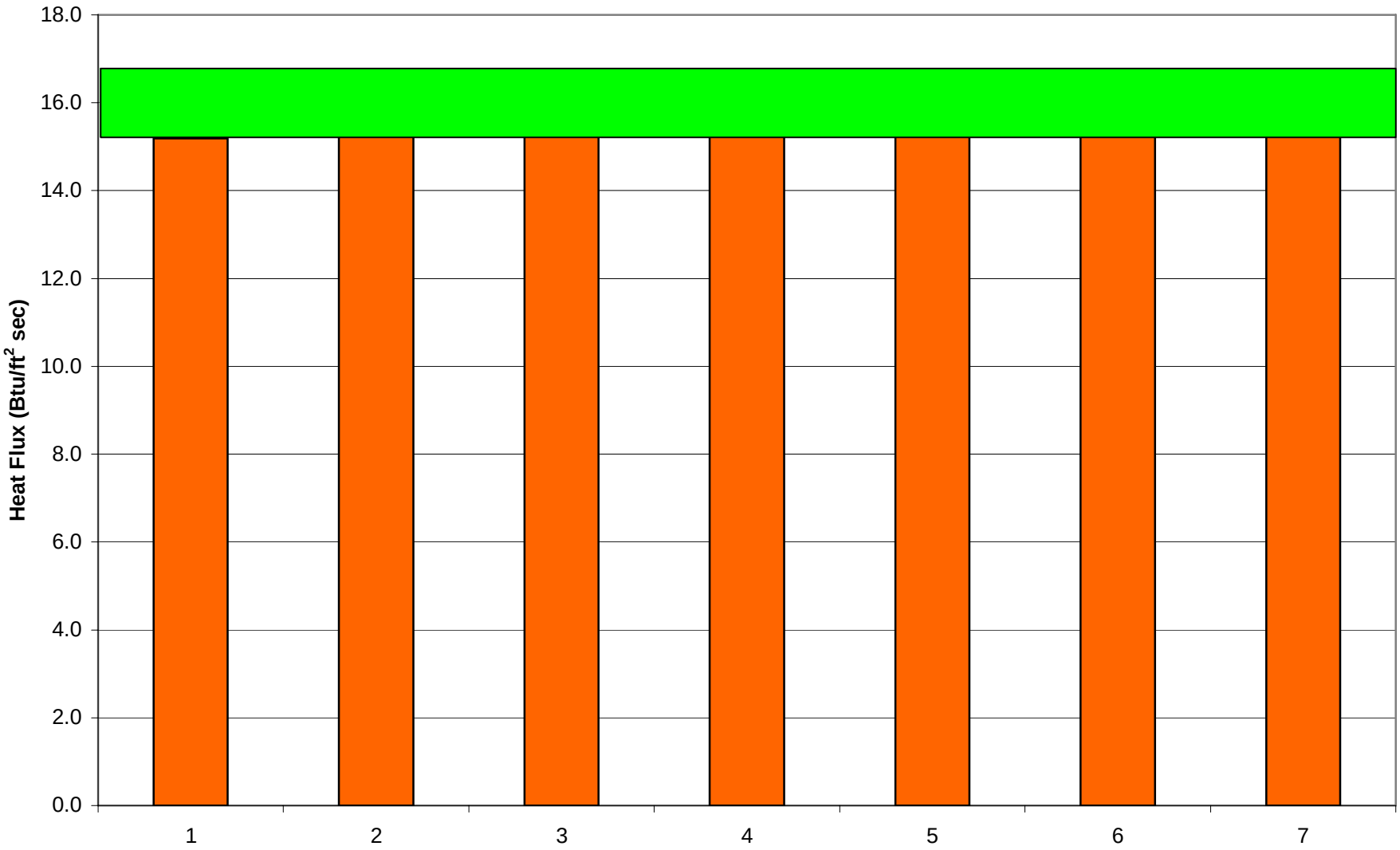
1 batch of each material tested on new sonic burner.

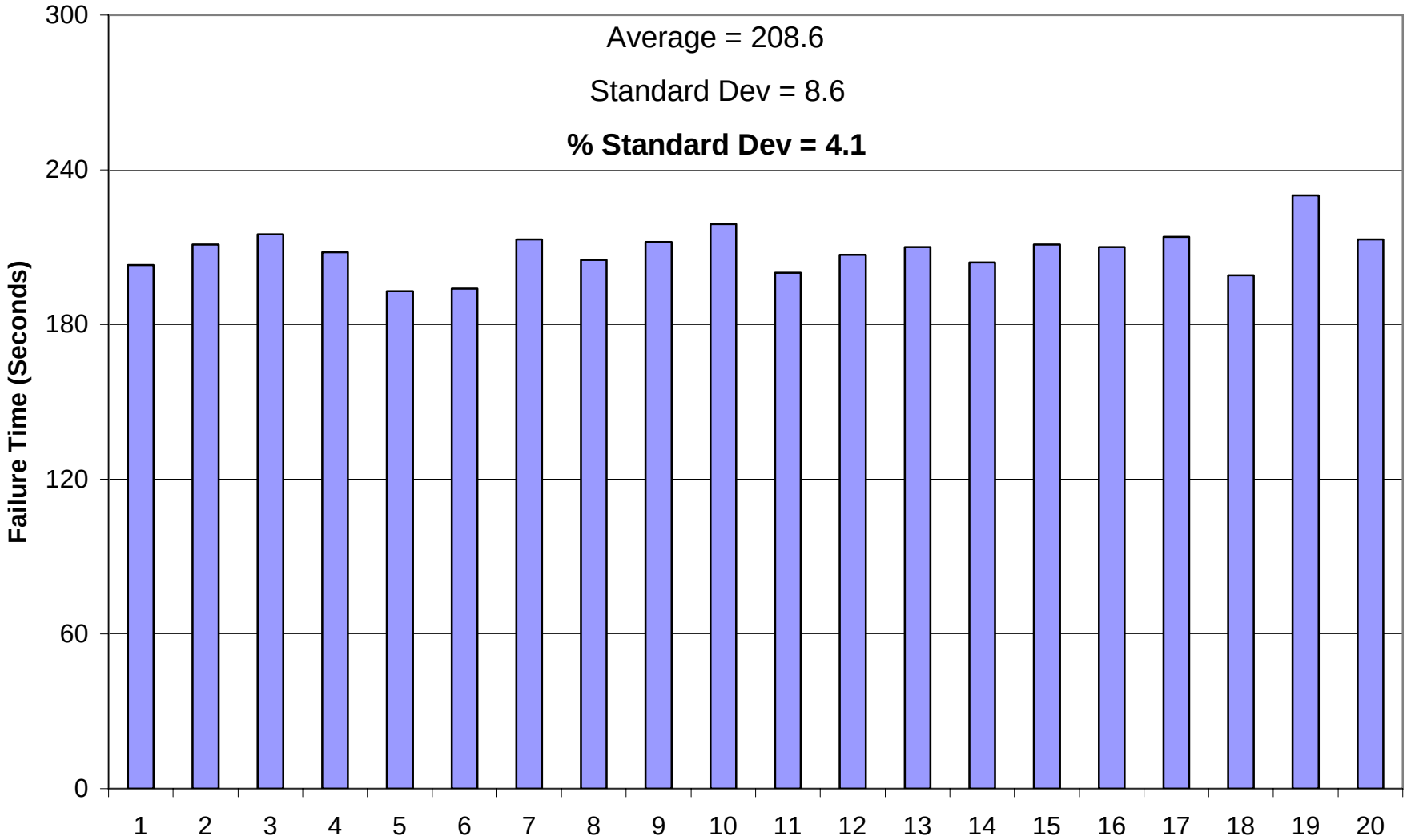
Additional material became available for running quality checks on each new sonic burner as it was assembled.

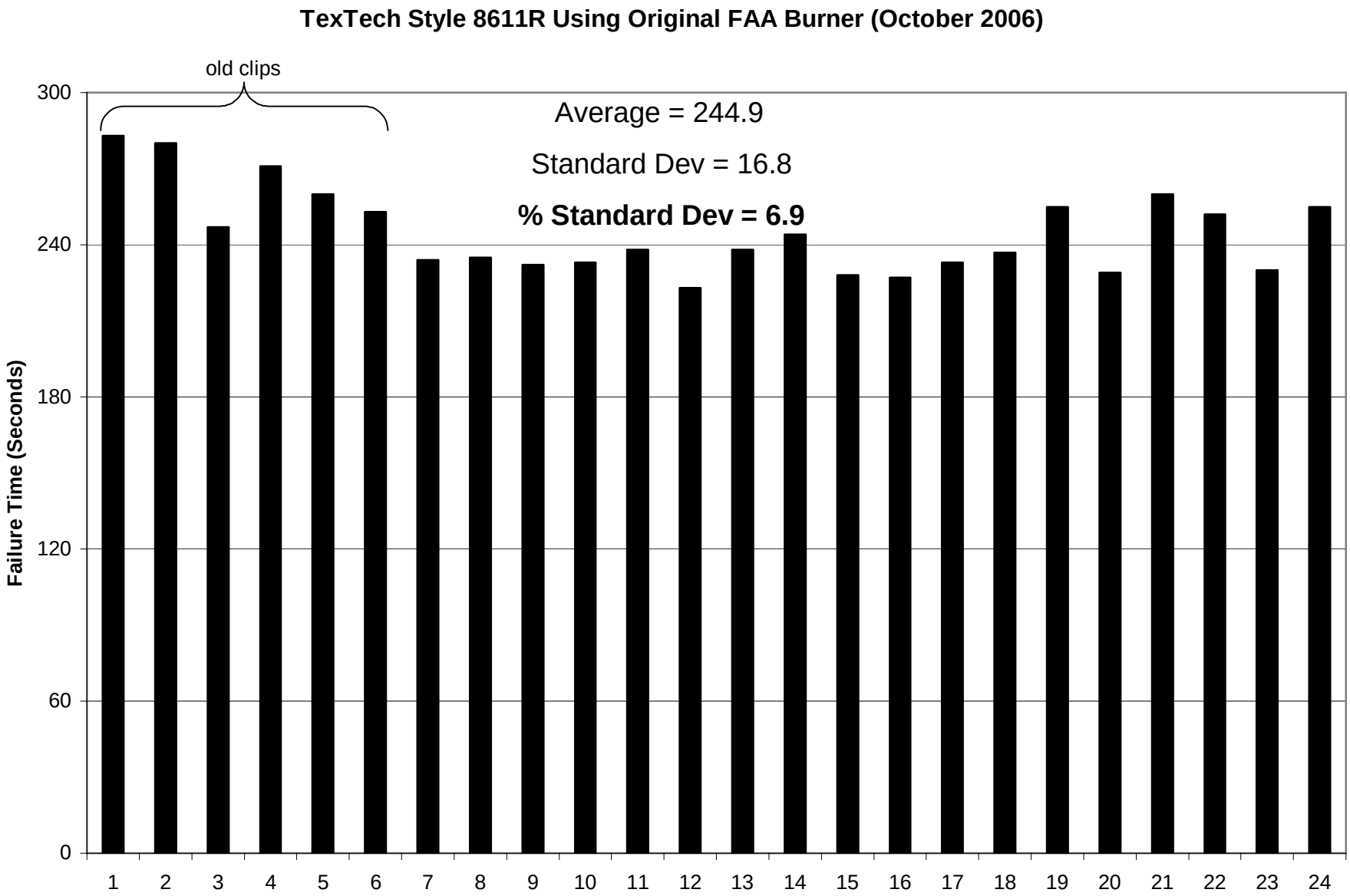
October 2006 Trials at FAATC



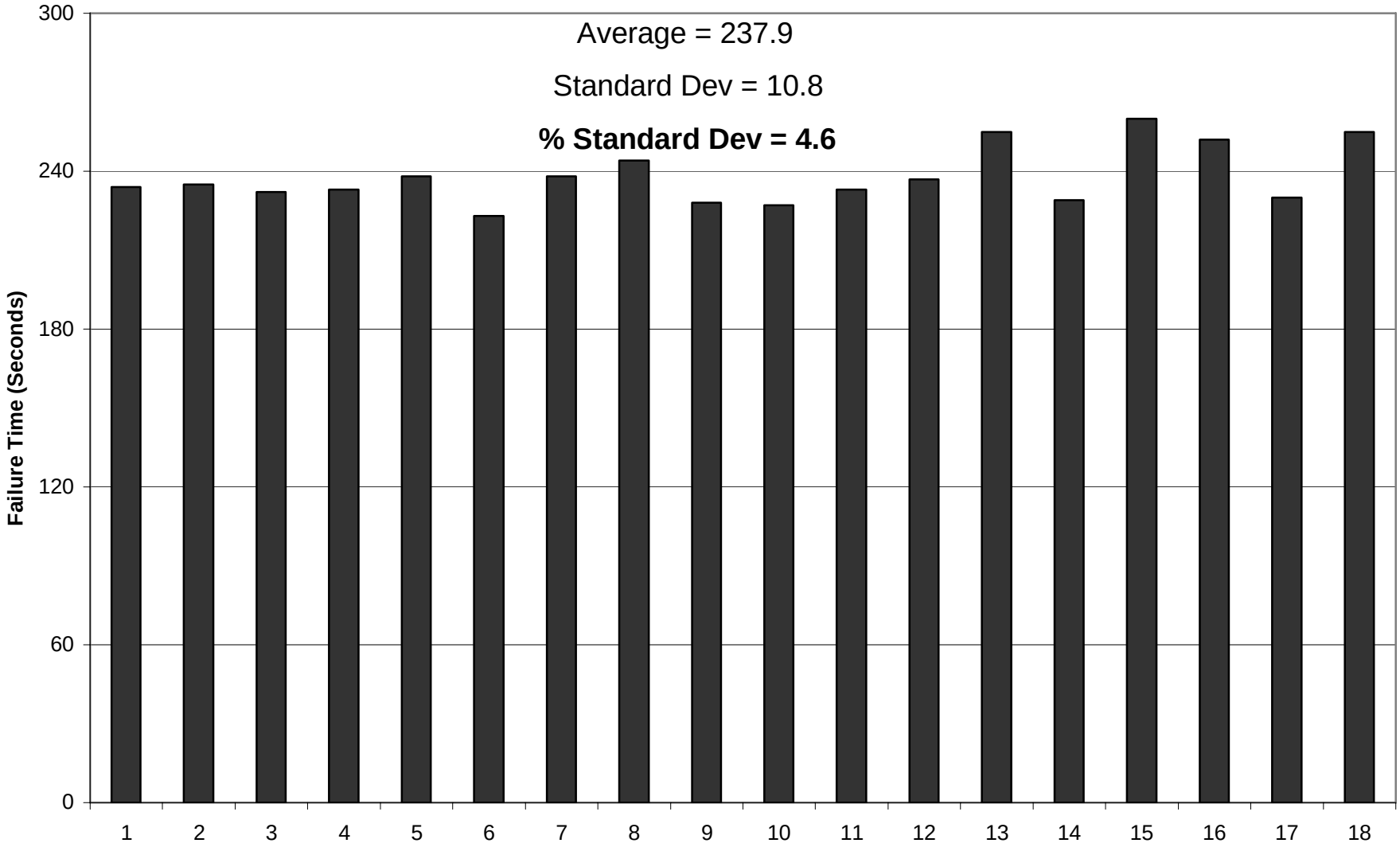
October 2006 Trials at FAATC




TexTech Style 8579R Using Original FAA Burner (October 2006)
Average = 208.6
Standard Dev = 8.6
% Standard Dev = 4.1
Failure Time (Seconds)
300
240
180
120
60
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20


TexTech Style 8611R Using Original FAA Burner (October 2006)
old clips
Average = 244.9
Standard Dev = 16.8
% Standard Dev = 6.9
Failure Time (Seconds)
300
240
180
120
60
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

TexTech Style 8611 Using Original FAA Burner (new clips only)

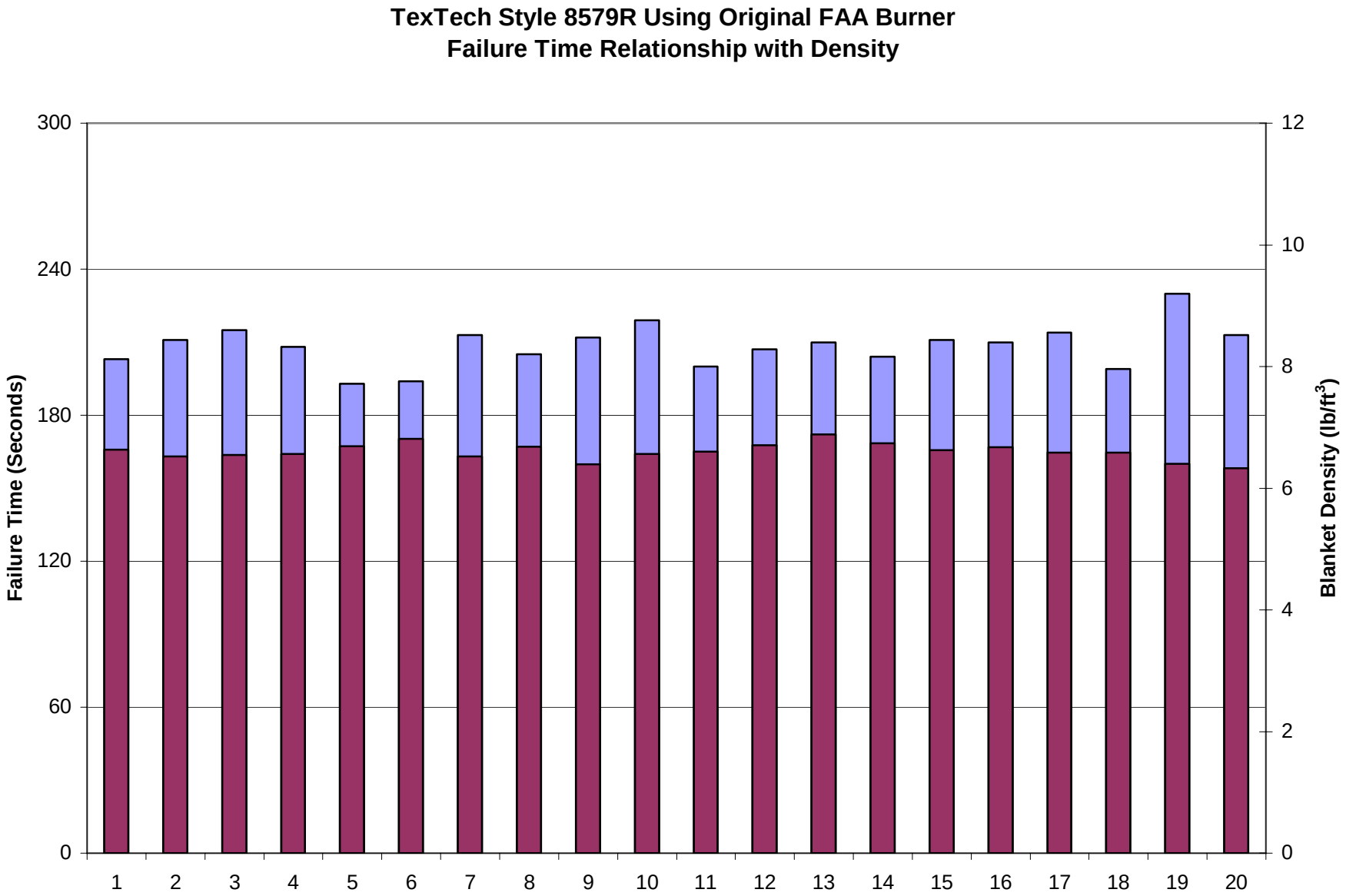


Relationship of Blanket Density and Failure Time

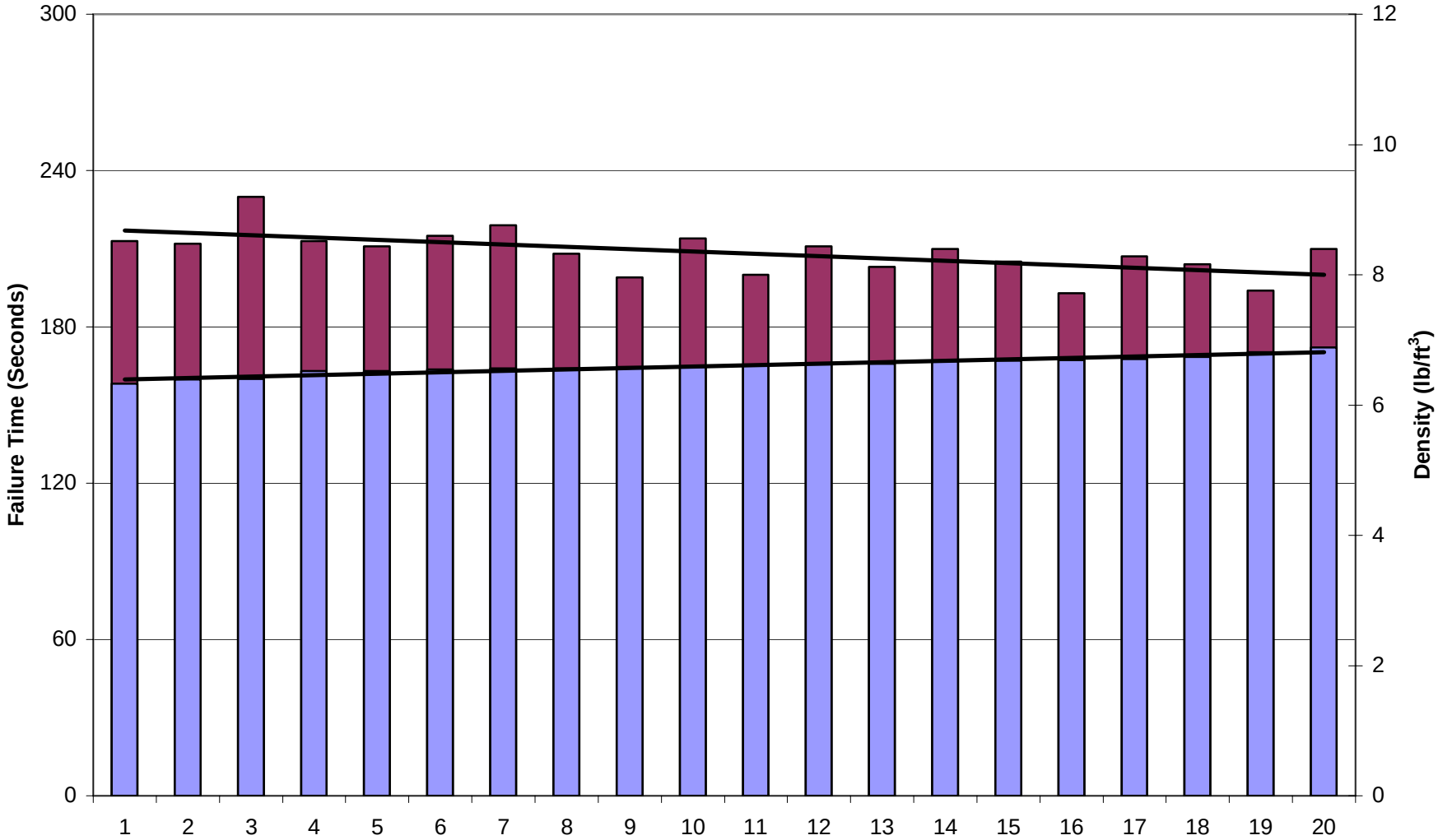
Question: Do the longer burnthrough failure times correlate to an increased blanket density?

TexTech Industry agreed to supply all weight and thickness data for each sample tested in the trials.

Weight and thickness data only supplied for first batch of material 8579R.


TexTech Style 8579R Using Original FAA Burner
Failure Time Relationship with Density
Failure Time (Seconds)
Blanket Density (lb/ft3)
300
240
180
120
60
0
12
10
8
6
4
2
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

TexTech Style 8579R Using Original FAA Burner
Failure Time Relationship with Density (density in ascending order)



October 2006 Trials at FAATC

Test results showed 8579R was equally consistent when tested on FAATC original burner.

Test results from 8611R indicated comparable consistency to 8579R*.

Test results indicated no correlation between increased burnthrough time and increased blanket density.

*when data removed for tests using old clips