Preliminary Analysis of RHIC Targets 2011

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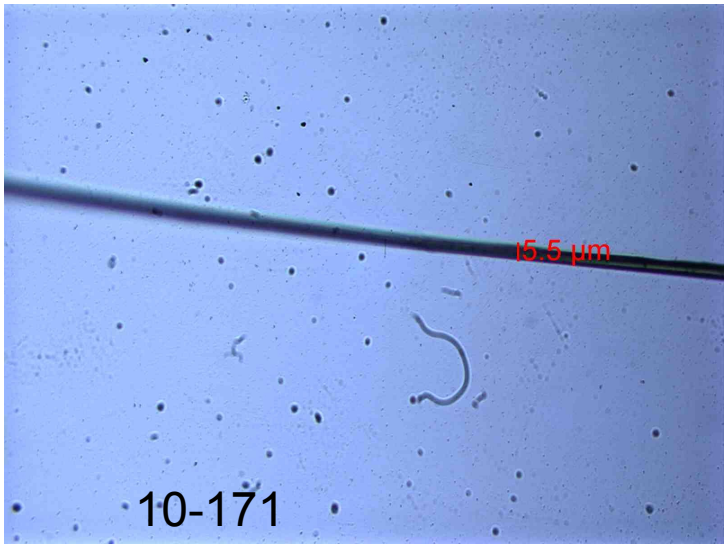
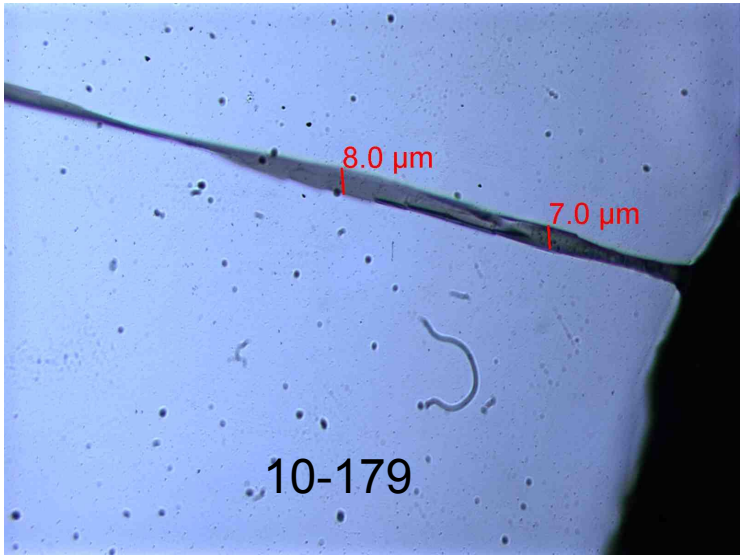
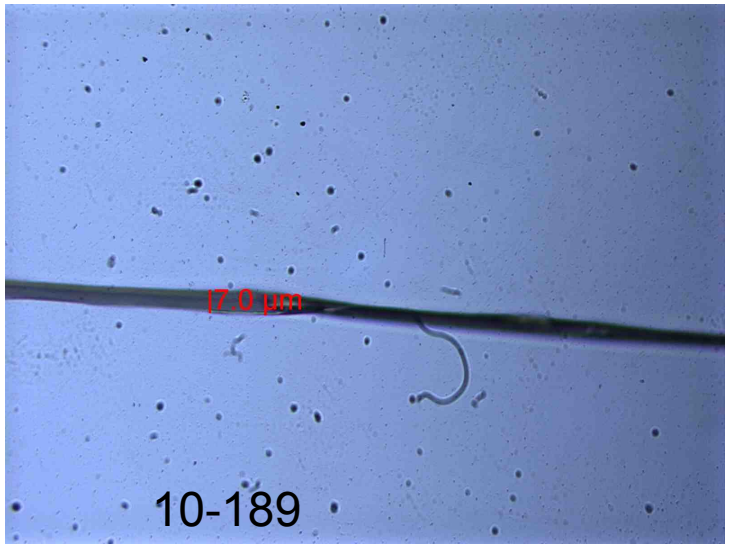
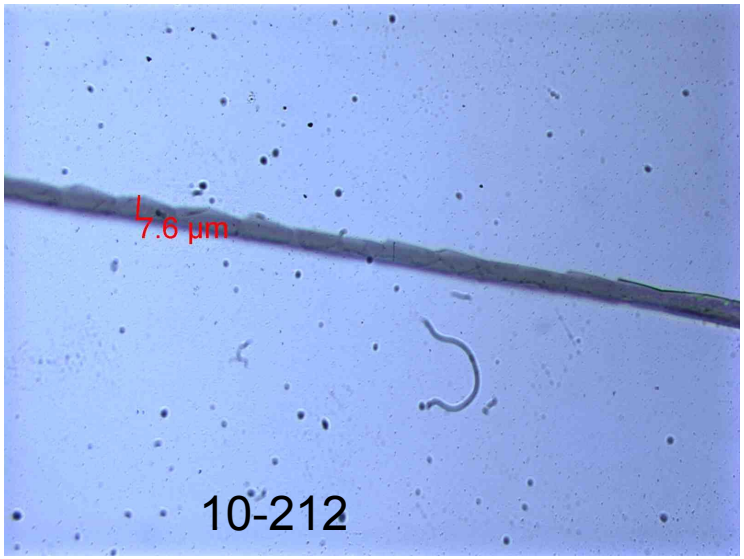
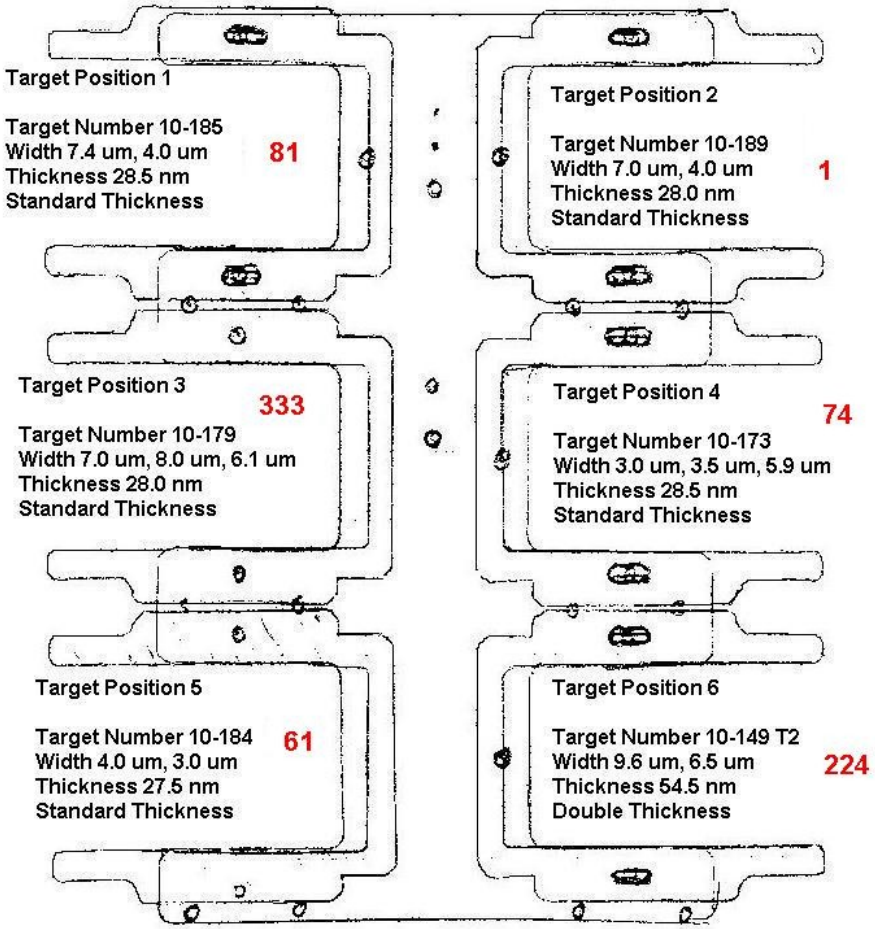

5.5 µm
10-171


8.0 µm
7.0 µm
10-179

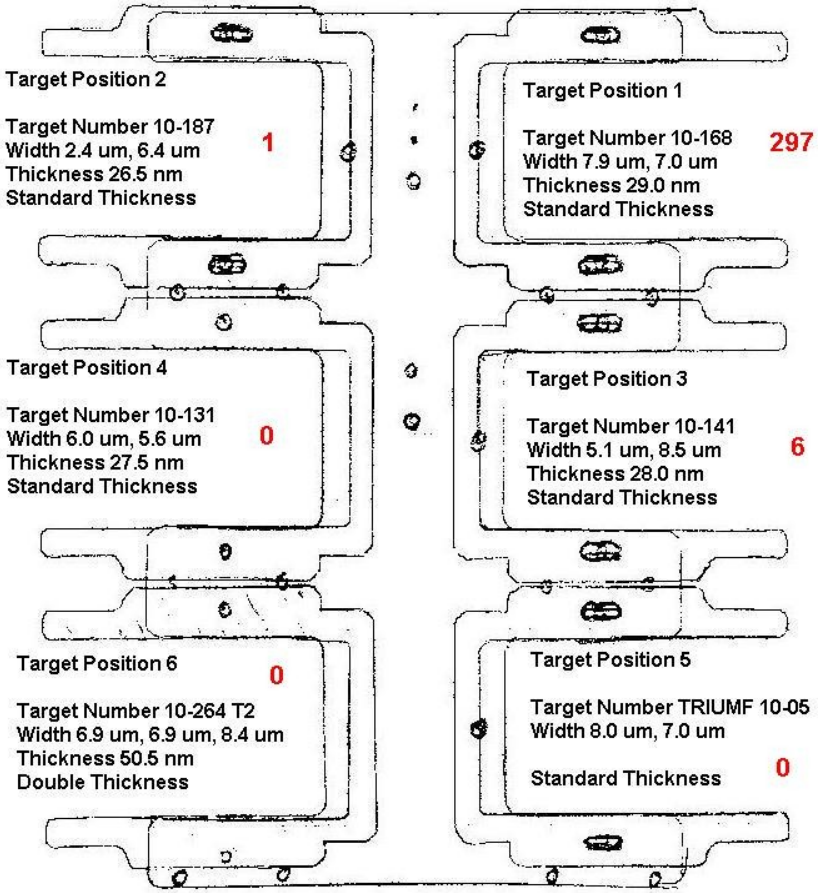

7.0 µm
10-189


7.6 µm
10-212



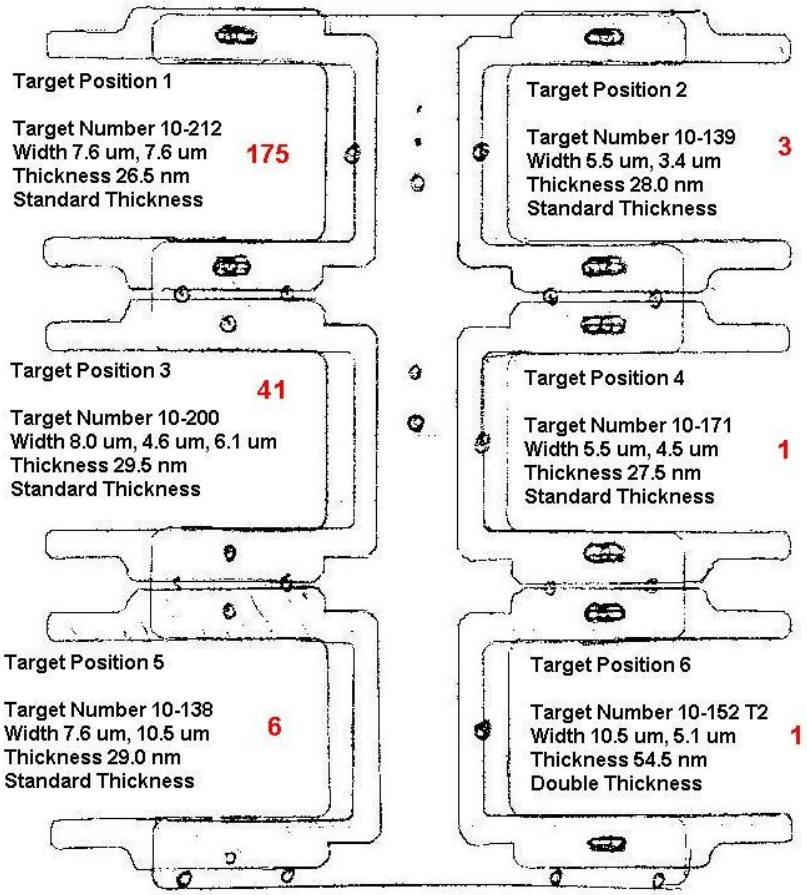
Blue 1 Horizontal Upstream

Ladder Total = 774



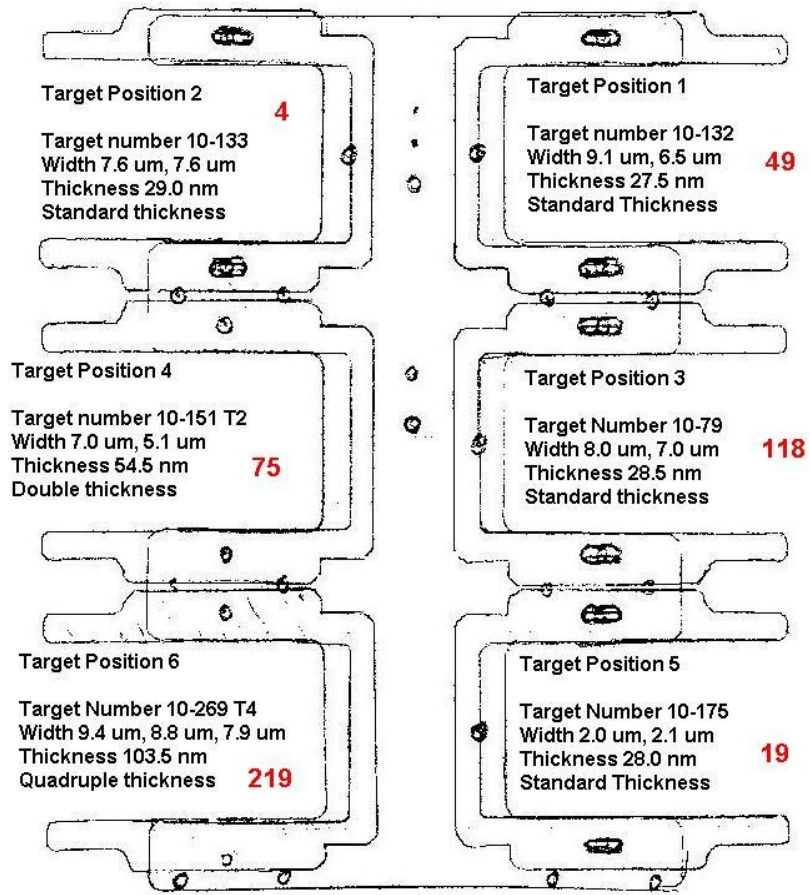
Blue 1 Vertical Upstream

Ladder Total = 304



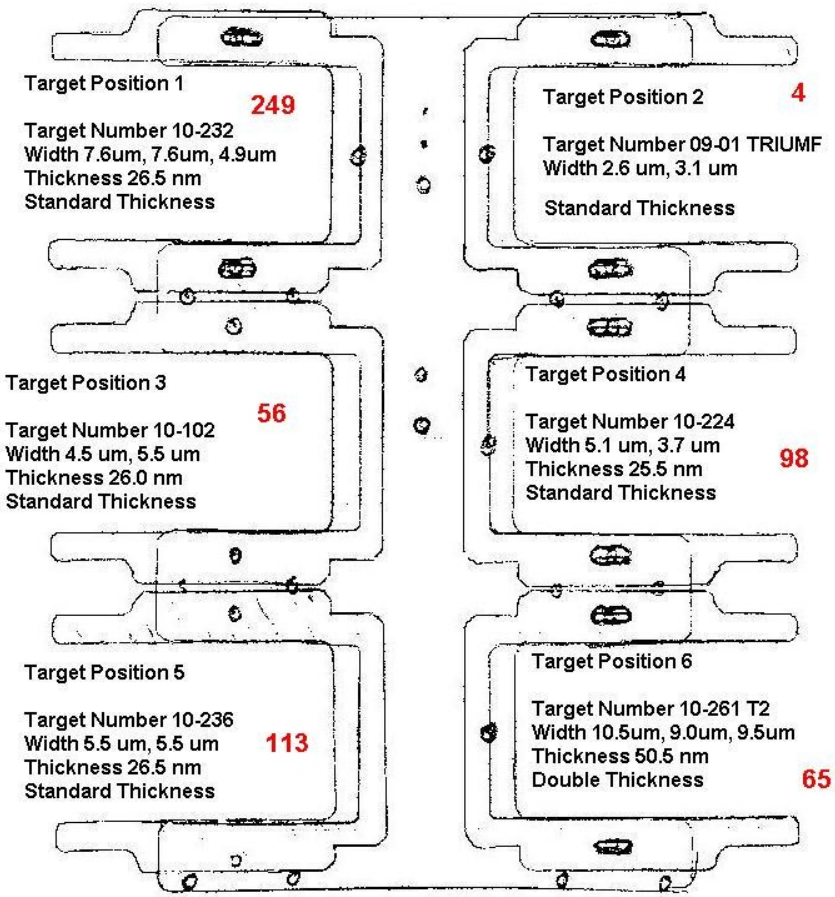
Blue 2 Horizontal Downstream

Ladder Total = 227



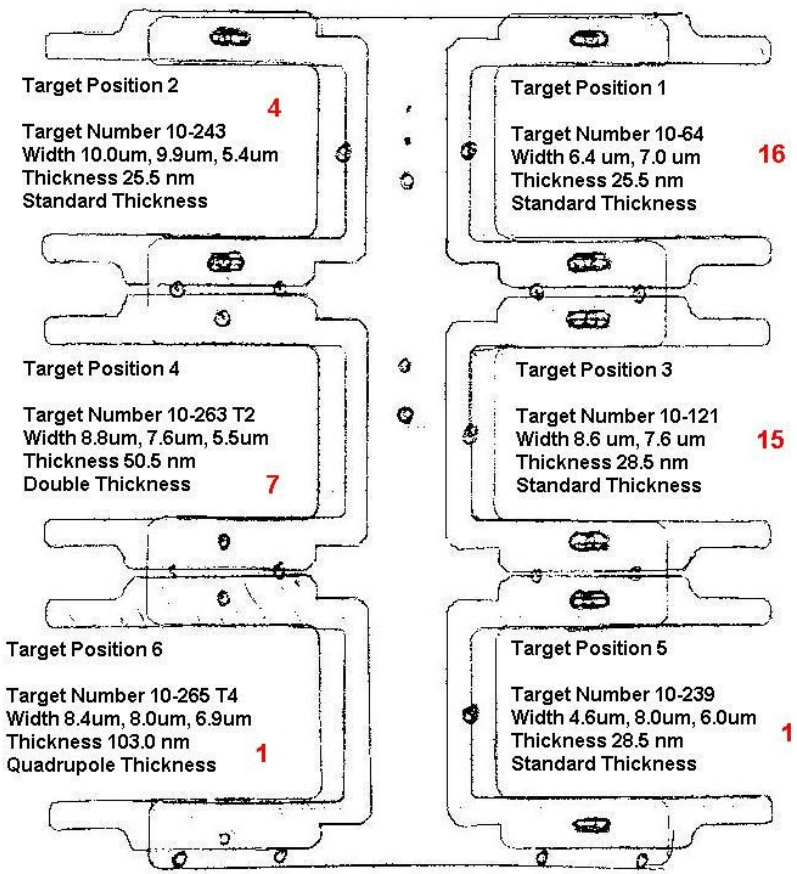
Blue 2 Vertical Downstream Targets Offset 2 mm

Ladder Total = 484



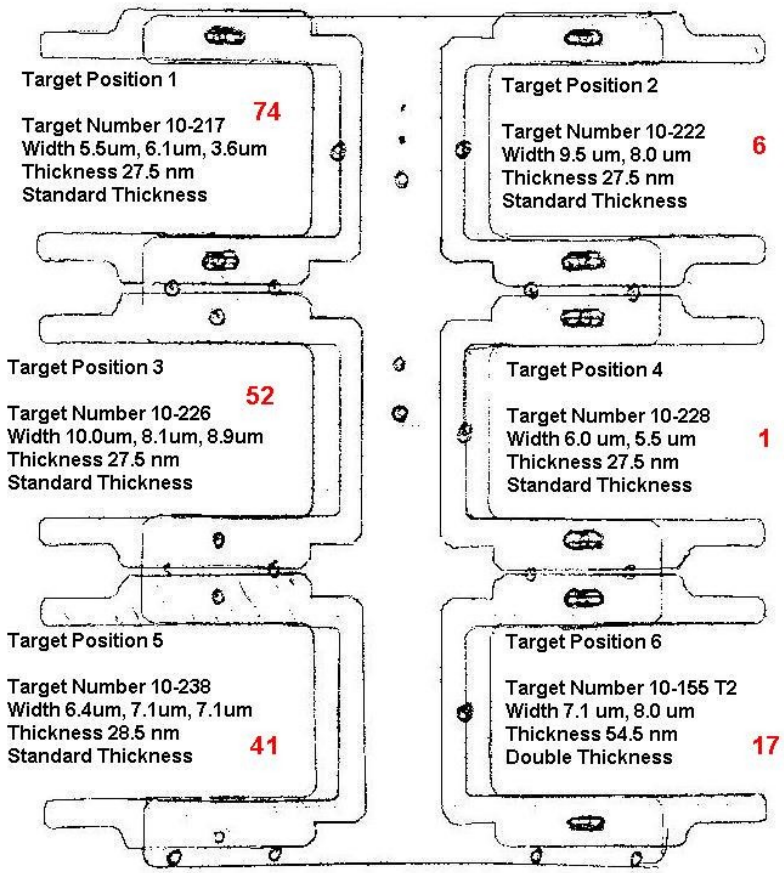
Yellow 1 Horizontal
Downstream

Ladder Total = 585



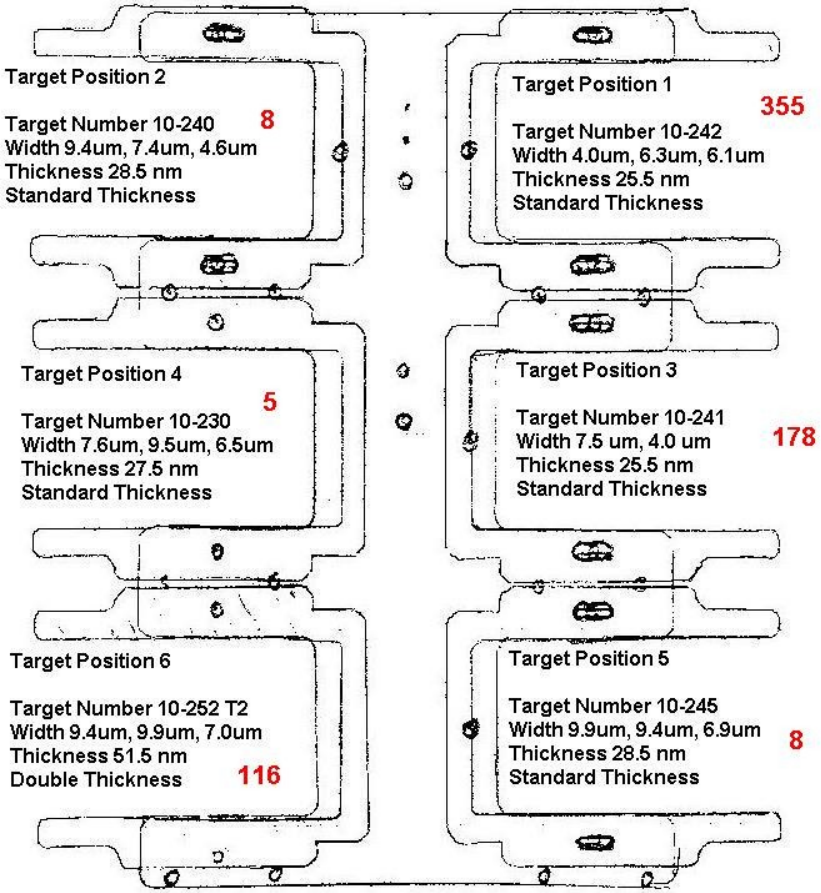
Yellow 1 Vertical
Downstream
Target Offset 2 mm

Ladder Total = 44



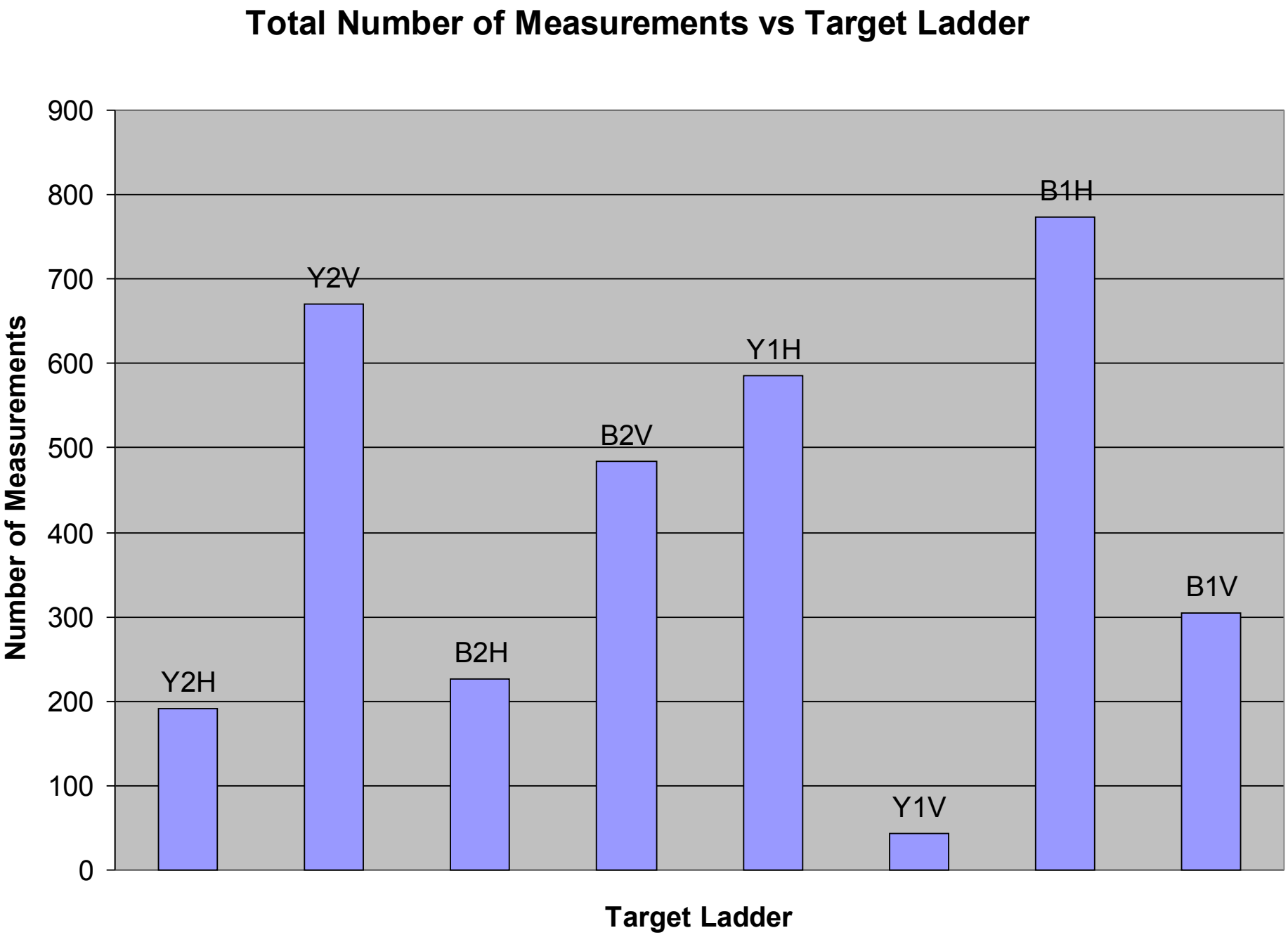
Yellow 2 Horizontal Upstream

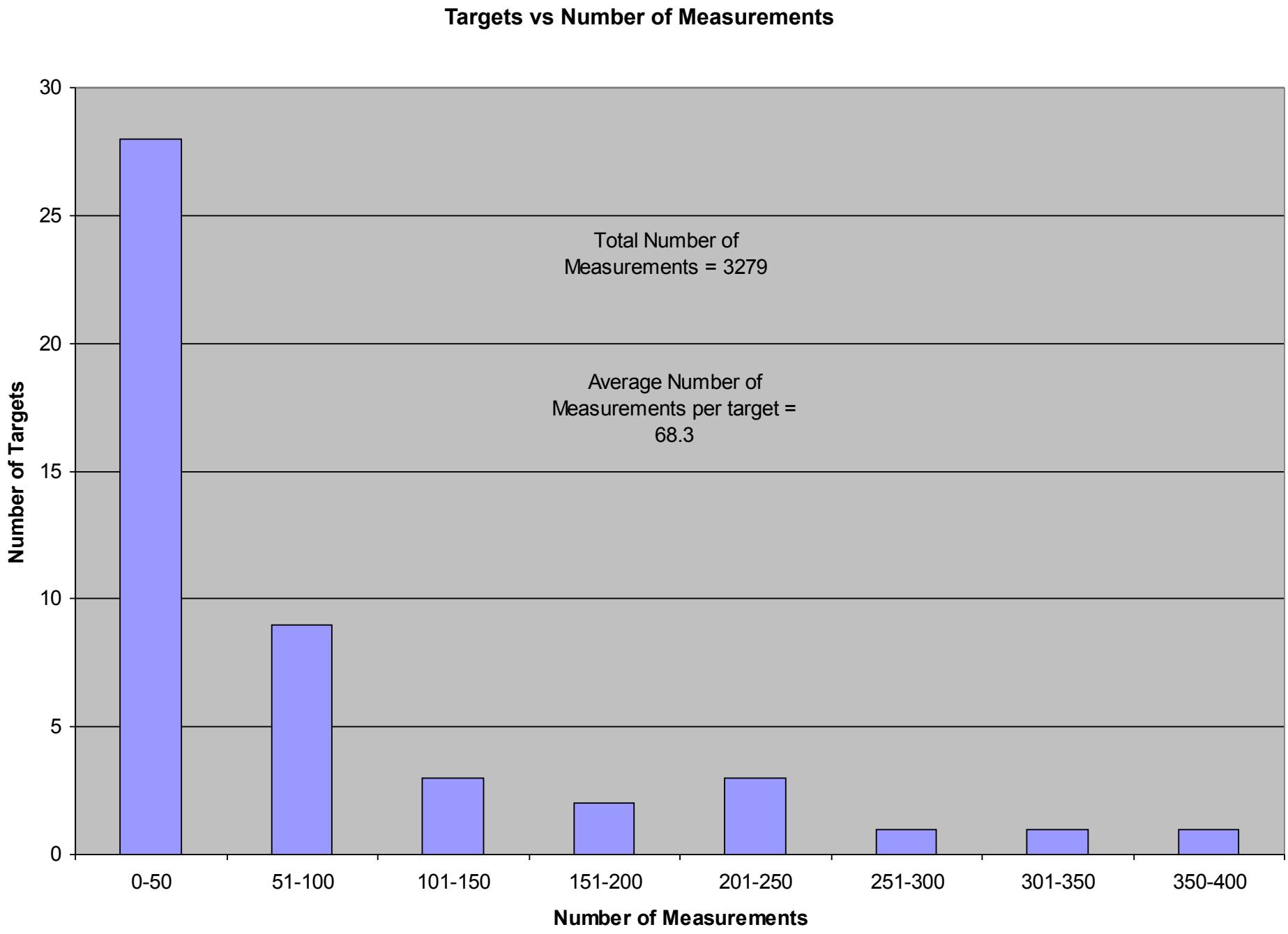
Ladder Total = 191

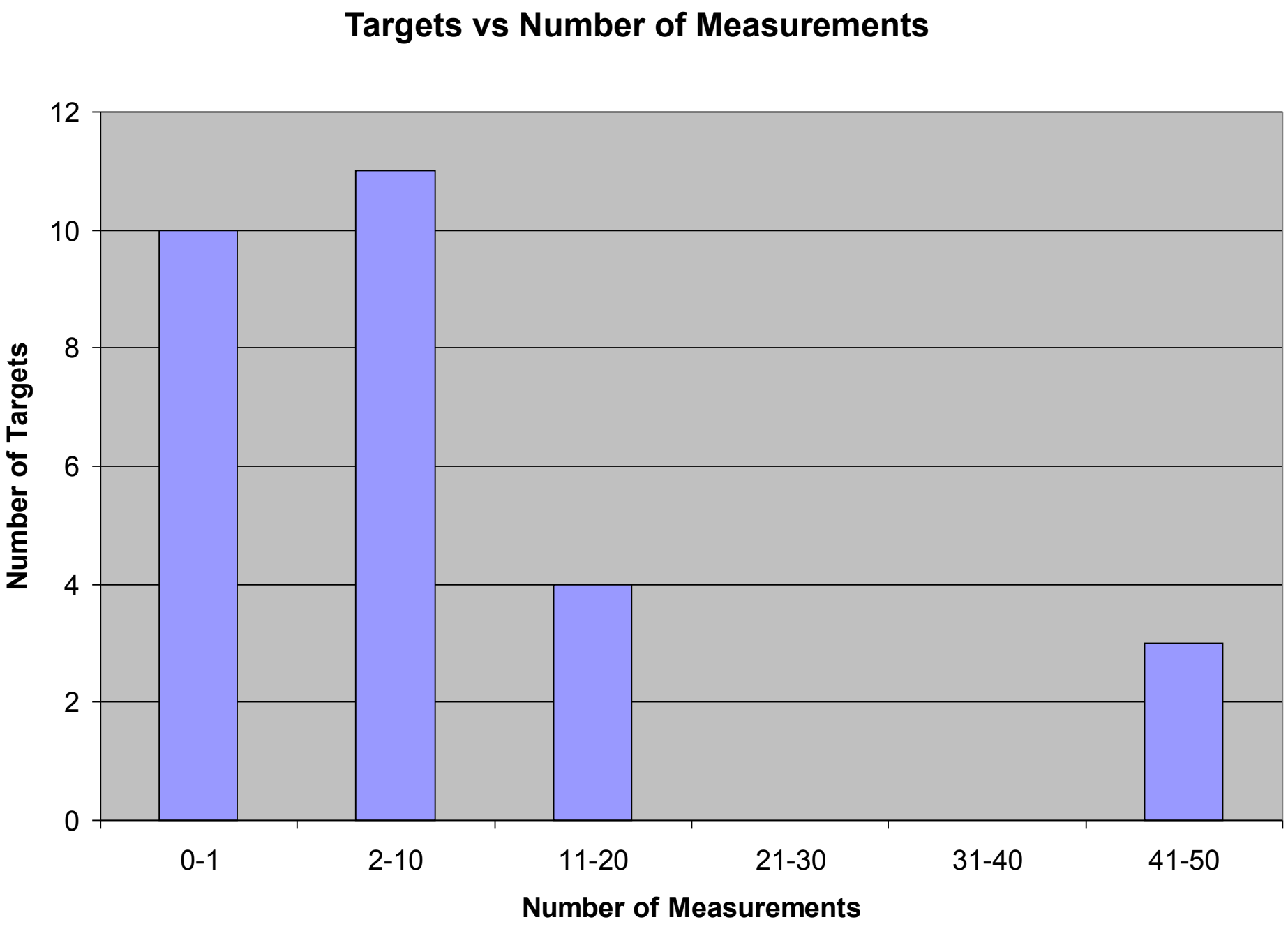


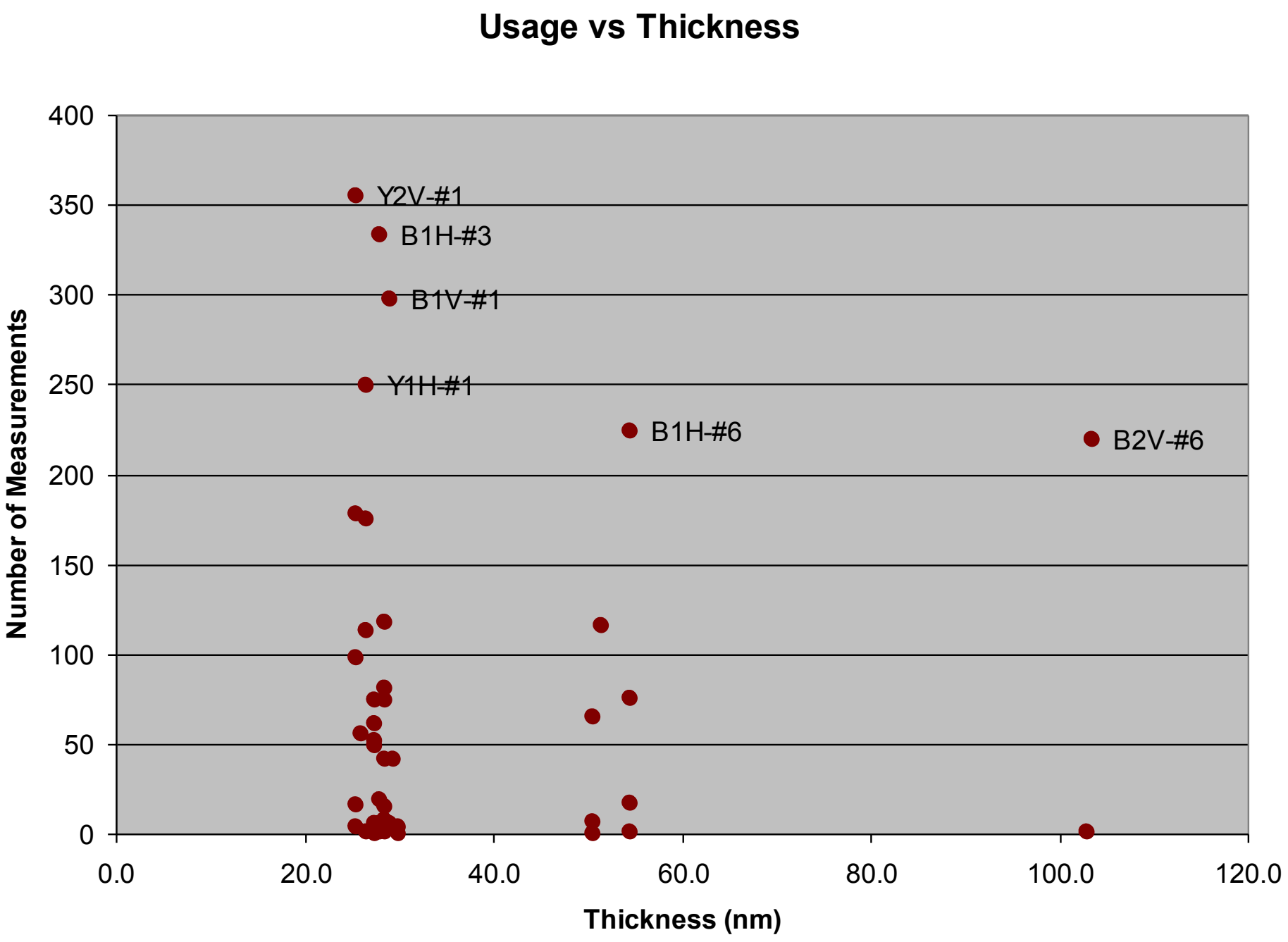
Yellow 2 Vertical Upstream

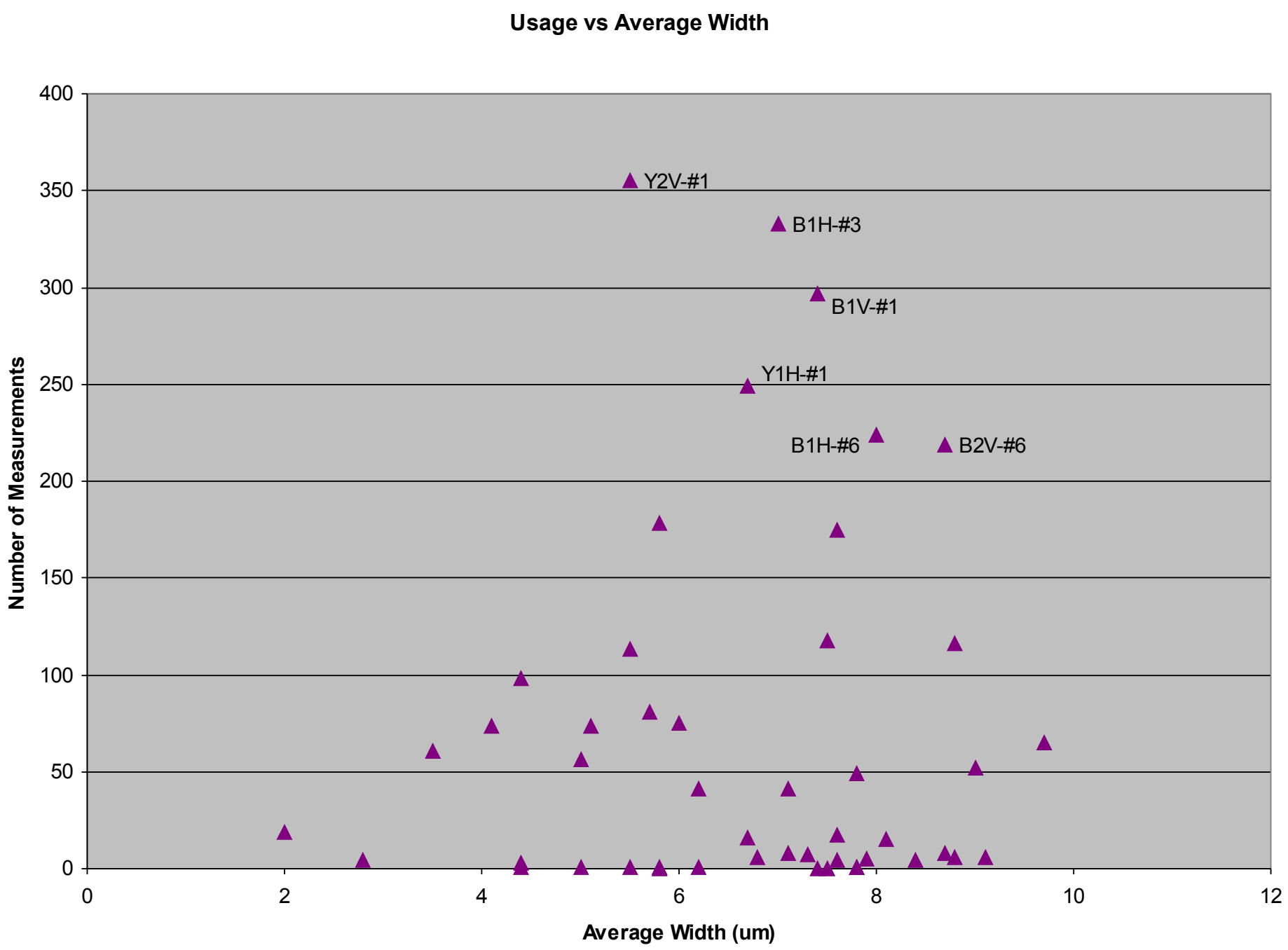
Ladder Total = 670

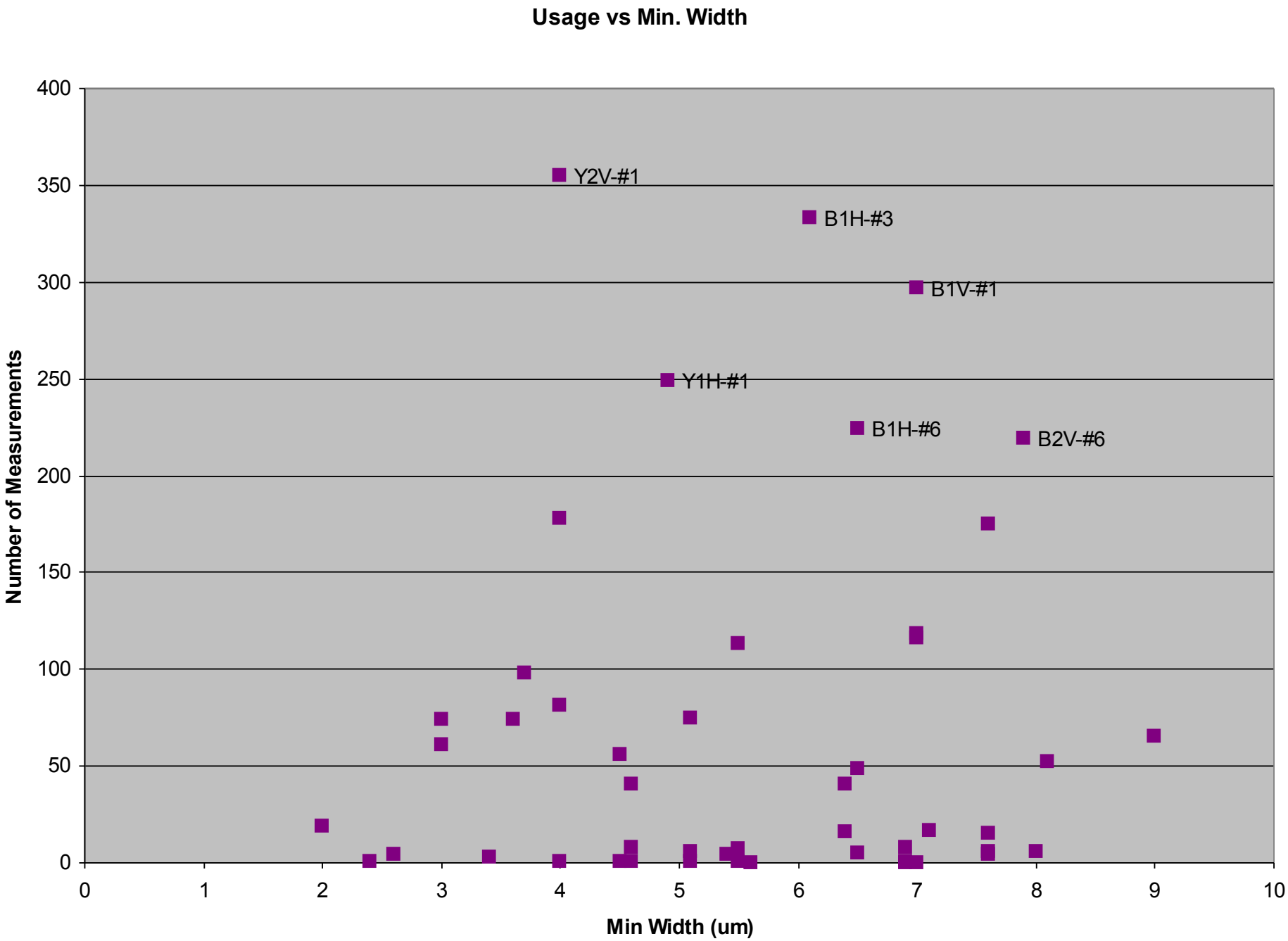

Total Number of Measurements vs Target Ladder
Number of Measurements
900
800
700
600
500
400
300
200
100
0
Y2H
Y2V
B2H
B2V
Y1H
Y1V
B1H
B1V
Target Ladder

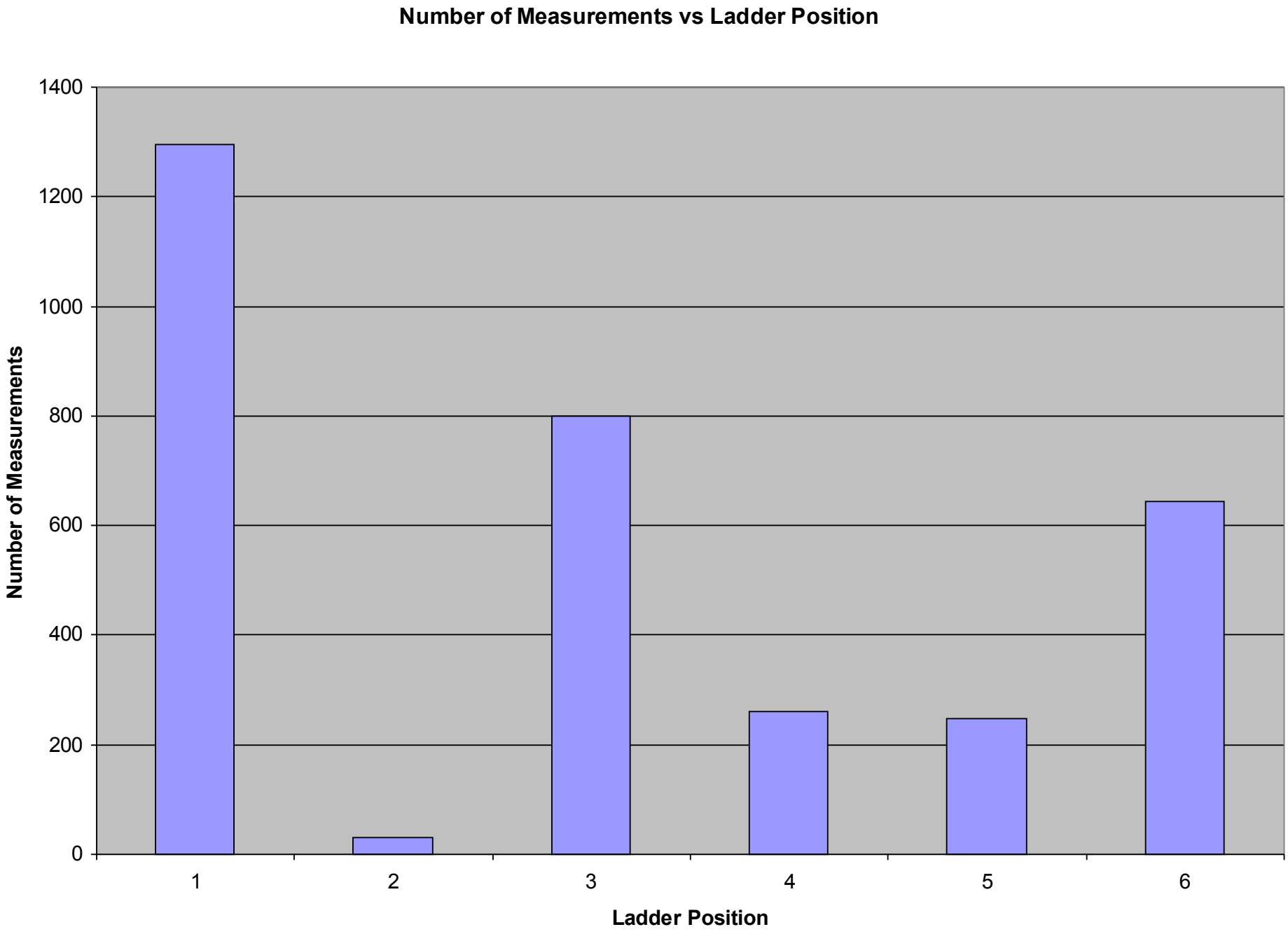

Targets vs Number of Measurements
Number of Targets
30
25
20
15
10
5
0
Total Number of Measurements = 3279
Average Number of Measurements per target = 68.3
0-50
51-100
101-150
151-200
201-250
251-300
301-350
350-400
Number of Measurements

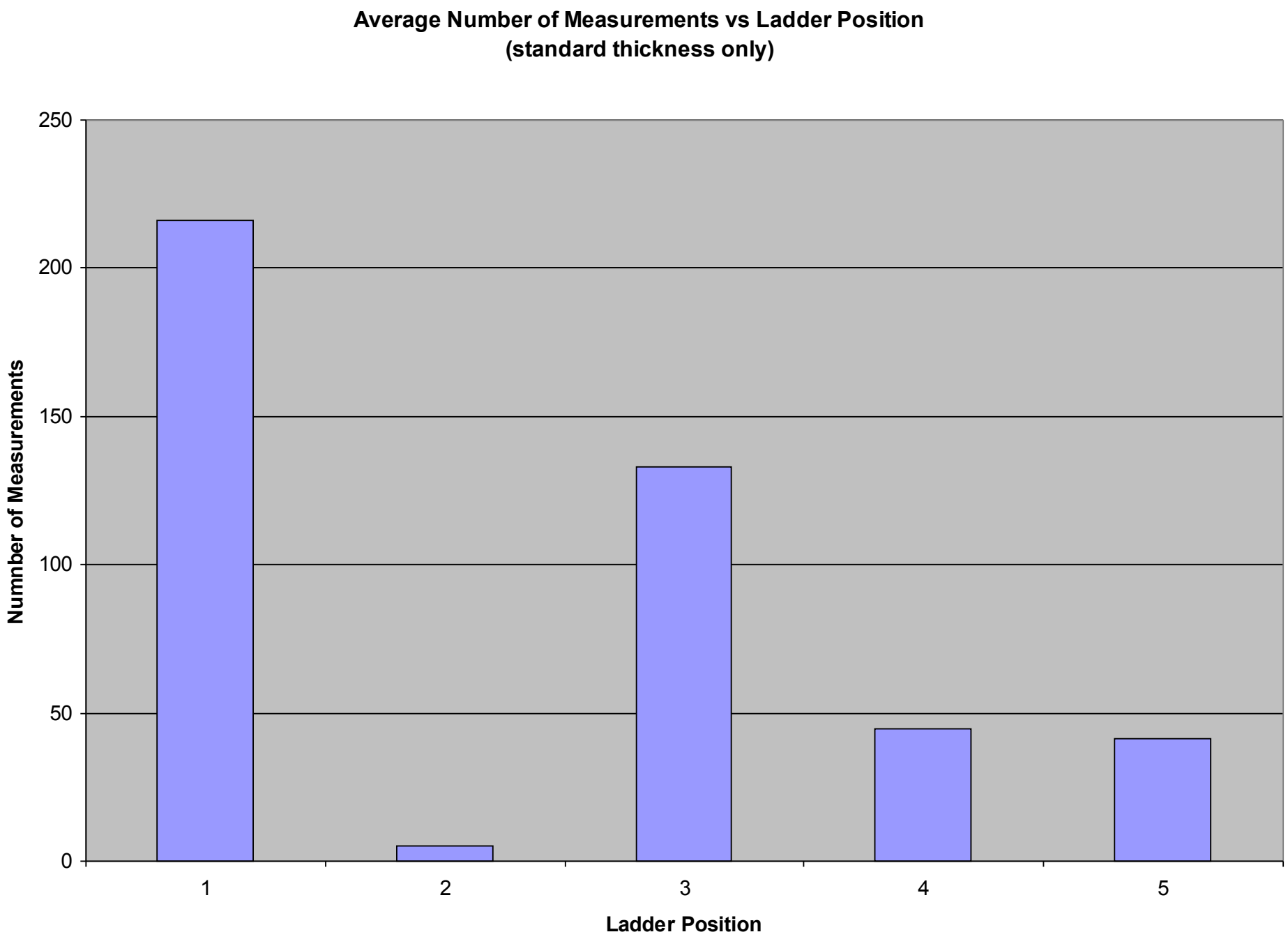

Targets vs Number of Measurements
Number of Targets
12
10
8
6
4
2
0
0-1
2-10
11-20
21-30
31-40
41-50
Number of Measurements


Usage vs Thickness
Number of Measurements
Thickness (nm)
400
350
300
250
200
150
100
50
0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
Y2V-#1
B1H-#3
B1V-#1
Y1H-#1
B1H-#6
B2V-#6


Usage vs Average Width
Number of Measurements
Average Width (um)
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
Y2V-#1
B1H-#3
B1V-#1
Y1H-#1
B1H-#6
B2V-#6


Usage vs Min. Width
Number of Measurements
Min Width (um)
400
350
300
250
200
150
100
50
0
0
1
2
3
4
5
6
7
8
9
10
Y2V-#1
B1H-#3
B1V-#1
Y1H-#1
B1H-#6
B2V-#6


Number of Measurements vs Ladder Position
Number of Measurements
1400
1200
1000
800
600
400
200
0
1
2
3
4
5
6
Ladder Position


Average Number of Measurements vs Ladder Position
(standard thickness only)
Numnber of Measurements
250
200
150
100
50
0
1
2
3
4
5
Ladder Position

Summary

- ~20% of the Targets (10) were broken immediately (0 or 1 measurement) and ~40% (21) Targets were used for >10 measurements
- No correlation between width and lifetime or thickness and lifetime
- Most of the measurements were made with targets in ladder positions 1 and 3
- The Y1V holder had the lowest number of measurements

Recommendation

- Conduct a “Stress Test” on a couple of the target ladders (particularly Y1V)
- Load the ladder with targets and pump out polarimeter
- Cycle the ladder ~1000 times with visual inspection of the targets every 100 – 200 cycles
- Test to be conducted in July or August