



**pammarco**

---

**banded roll test**



This test was done as a joint effort between INX, Pamarco and American Packaging. INX is American Packaging's ink supplier and has been struggling to get the color that is printed on the press to match the customer approved sample. They use an instrument called a spectrophotometer which measures the color in L, A, B, C and Delta E. L is the strength of the color, A and B are the hue or shade and C is chroma, or how clean or dirty the color is. There's a lot to color measurement. The most important measurement is Delta E. The typical accepted color variation is measured in Delta E and is acceptable when the printed color is no more than 2 Delta E points away from the standard. When an anilox loses volume, either from wear or plugging, it delivers a thinner ink film to the substrate, which can create a shift in the Delta E.

We engraved W&H Vistaflex anilox to a target of a 550 lpi, 5.5 bcm, 60 degree. We did a standard polish on the entire surface and hand polished 5 lanes in the center to reduced volumes to simulate anilox wear.

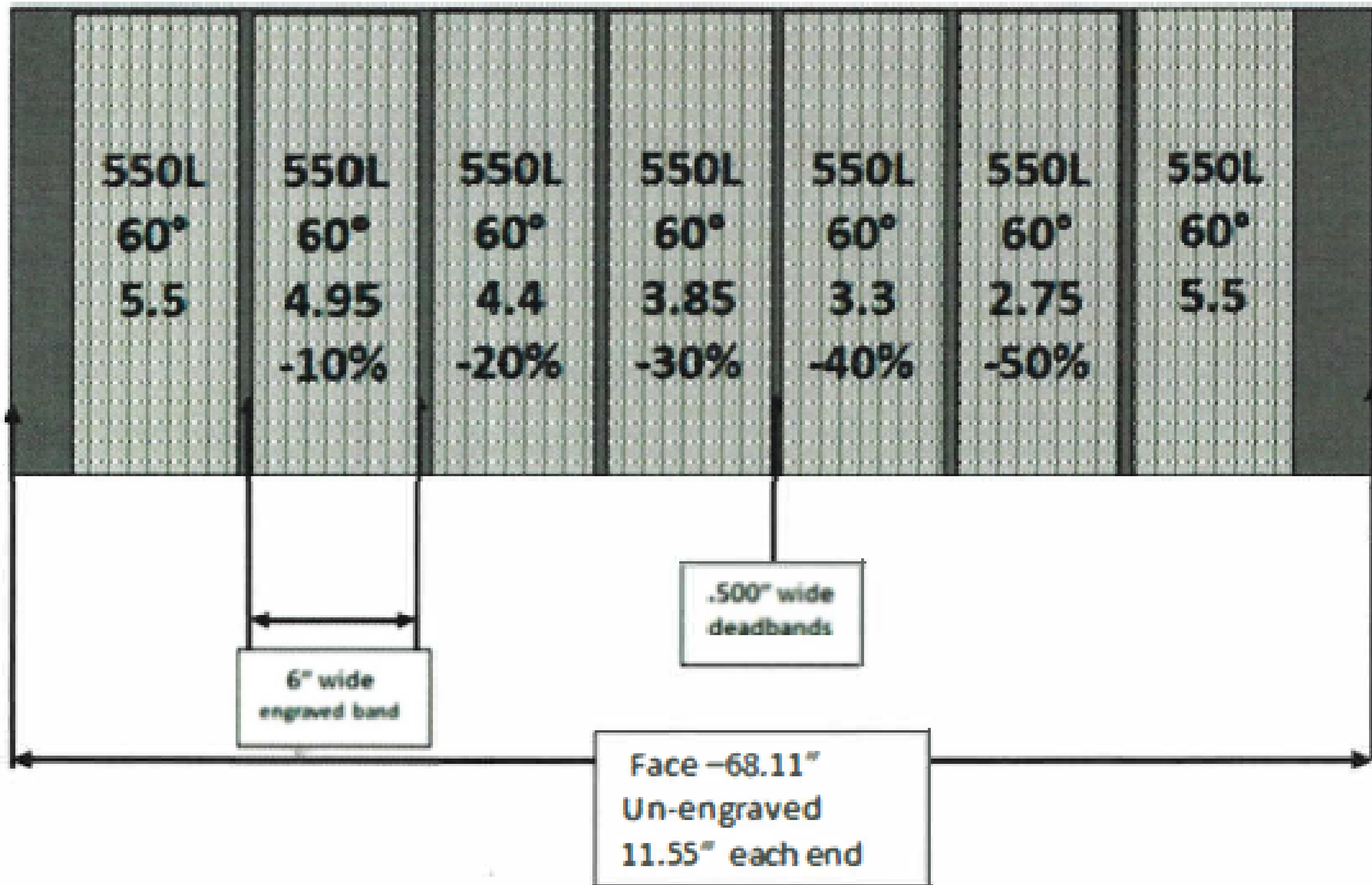
There were 7 lanes total.

Lane 1 - 5.41 BCM (98% of target)  
Lane 2 - 4.82 BCM (88% of target)  
Lane 3 - 4.44 BCM (81% of target)  
Lane 4 - 3.98 BCM (72% of target)  
Lane 5 - 3.48 BCM (63% of target)  
Lane 6 - 3.05 BCM (55% of target)  
Lane 7 - 5.31 BCM (97% of target)

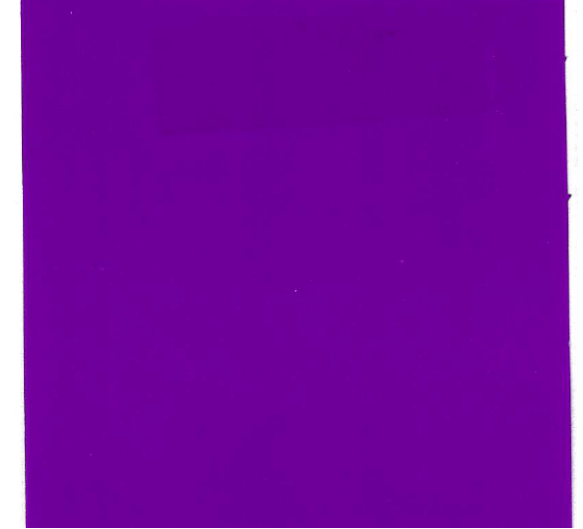
Color measurements were done with 6 colors including white. The samples provided are printed samples and spectrophotometric readings for each color from the first 6 bands. In general, the results show that once this engraving loses 80-85% of the original volume the Delta E reading is higher than the 2.0 tolerance.

This is significant because when this happens the anilox either needs to be cleaned or changed, or the ink needs to be adjusted until it matches the proof. This creates downtime on the press, which can cost a printer a significant amount of money. If we theorize that a press prints 100 jobs per month and 5 adjustments per job are needed, that would equal 6000 adjustments per press per year. If each adjustment costs on average \$100 dollars that means \$600,000 per press is spent on color matching each year. If the customer manages their anilox inventory properly, it can make a serious impact. Reducing each job by 1 adjustment can save \$120,000. That doesn't include the cost of wasted substrate and unusable ink.

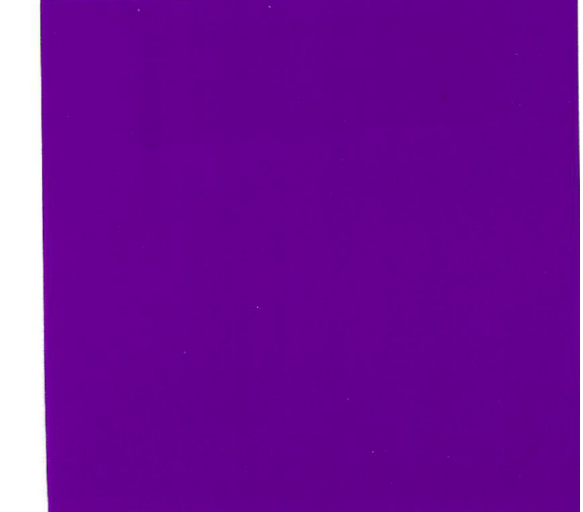
## W & H Vistaflex Banded Roll



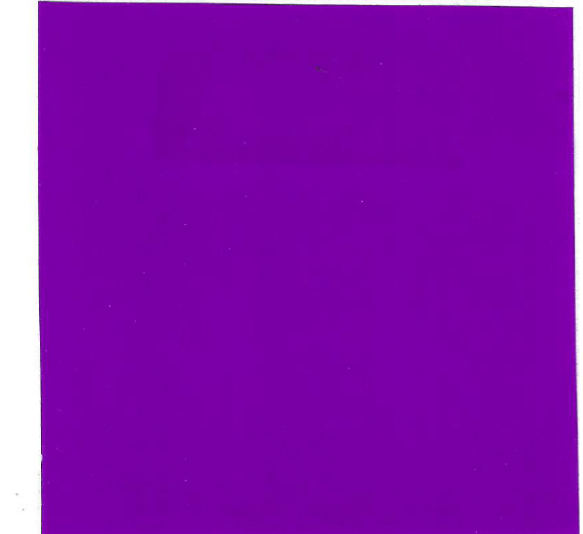
98%  
 $\Delta L$  -0.99  
 $\Delta a$  -2.16  
 $\Delta b$  1.65  
 $\Delta C$  -2.72  
 $\Delta h$  0.00  
 $\Delta E2000$  1.04



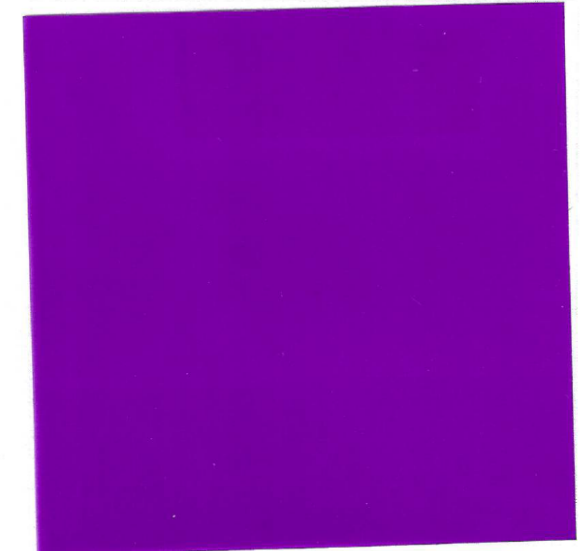
88%  
 $\Delta L$  -0.41  
 $\Delta a$  -3.02  
 $\Delta b$  2.19  
 $\Delta C$  -3.74  
 $\Delta h$  -0.08  
 $\Delta E2000$  0.94



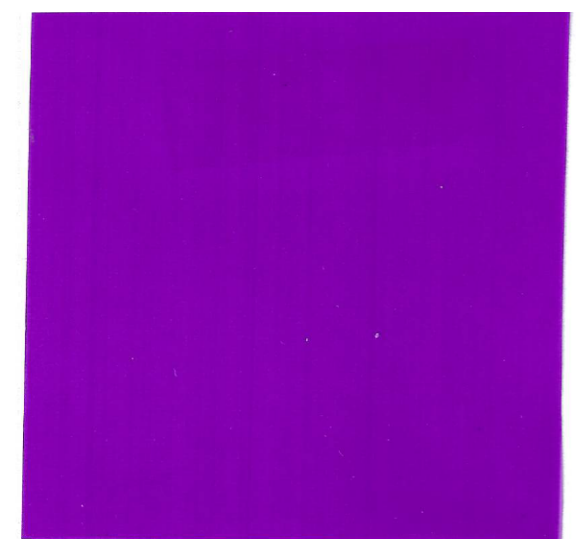
81%  
 $\Delta L$  2.75  
 $\Delta a$  -4.28  
 $\Delta b$  3.48  
 $\Delta C$  -5.52  
 $\Delta h$  0.14  
 $\Delta E2000$  2.68



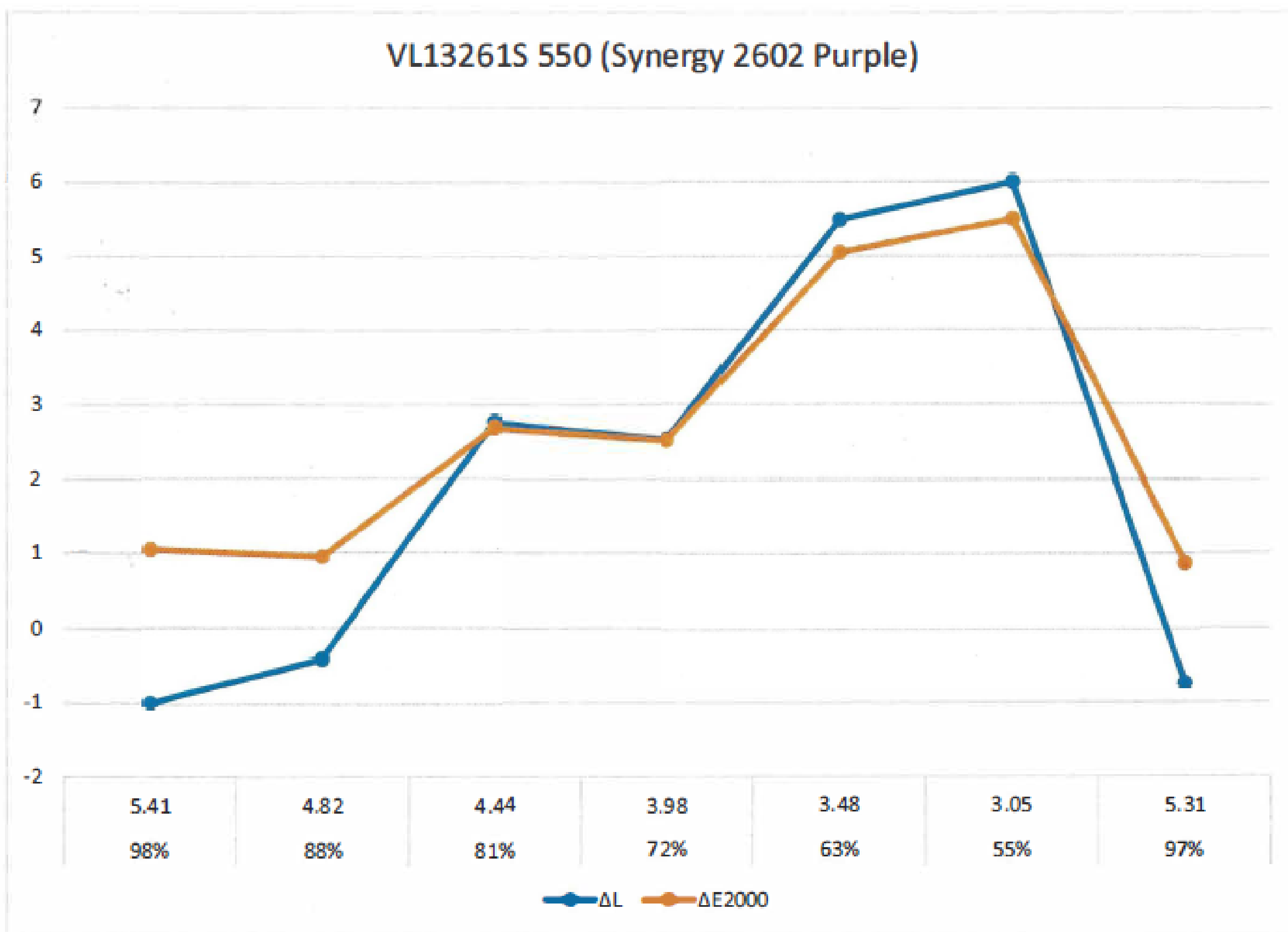
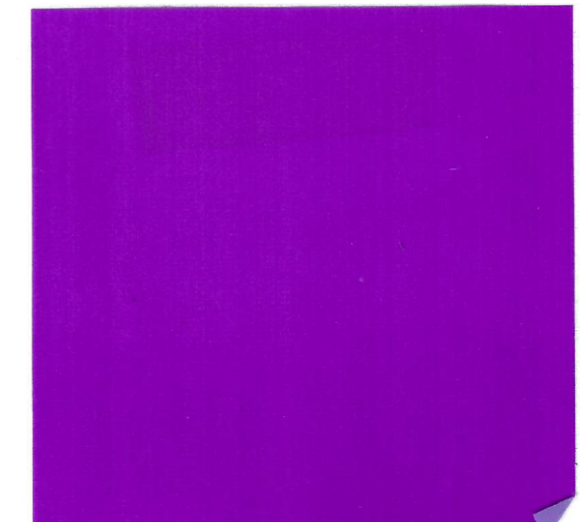
72%  
 $\Delta L$  2.52  
 $\Delta a$  -4.38  
 $\Delta b$  3.37  
 $\Delta C$  -5.53  
 $\Delta h$  0.01  
 $\Delta E2000$  2.51



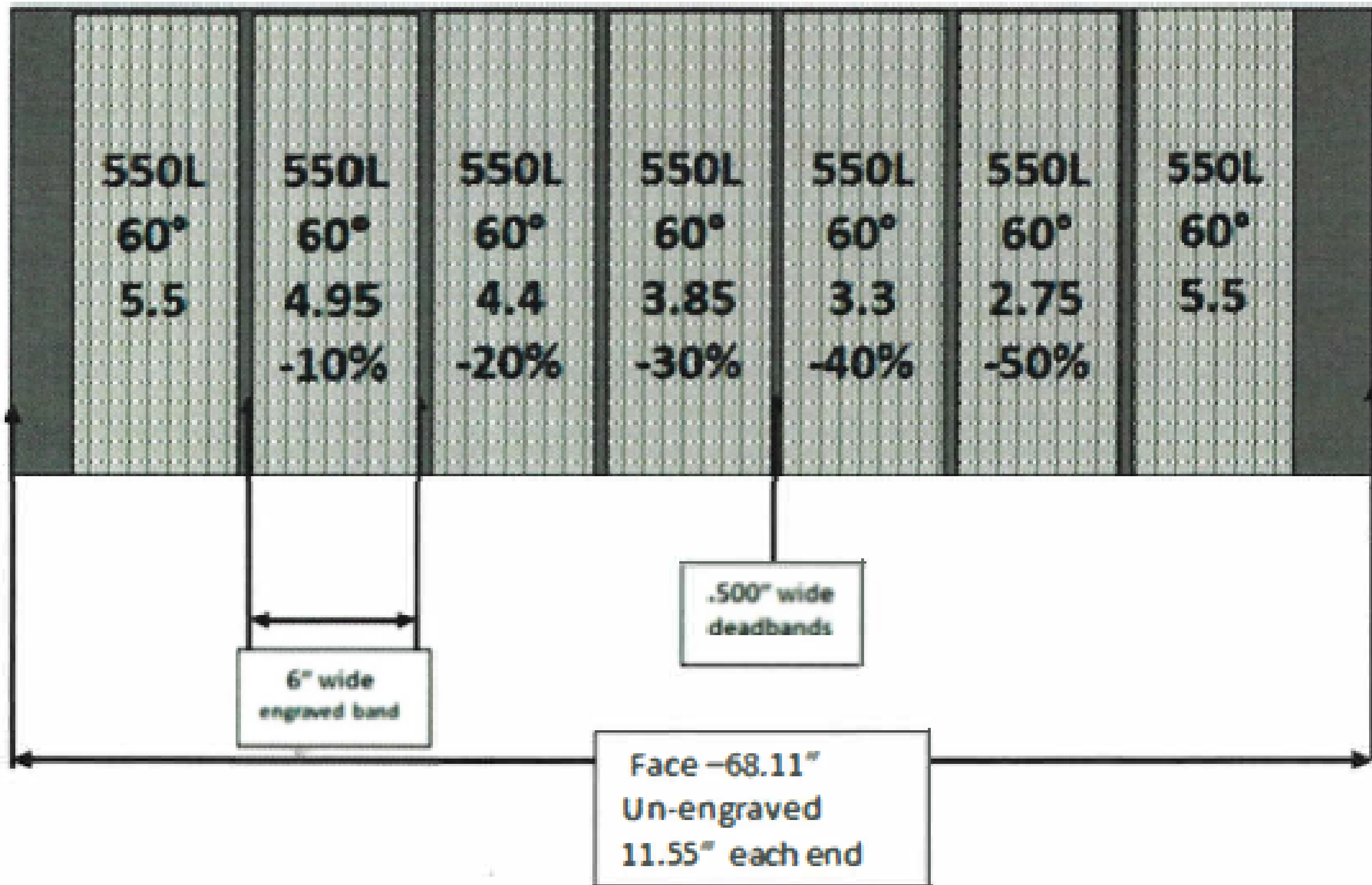
63%  
 $\Delta L$  5.49  
 $\Delta a$  -5.69  
 $\Delta b$  4.48  
 $\Delta C$  -7.25  
 $\Delta h$  0.08  
 $\Delta E2000$  5.05



55%  
 $\Delta L$  5.99  
 $\Delta a$  -6.04  
 $\Delta b$  4.59  
 $\Delta C$  -7.59  
 $\Delta h$  -0.03  
 $\Delta E2000$  5.50



## W & H Vistaflex Banded Roll



98%  
 $\Delta L$  -0.58  
 $\Delta a$  3.58  
 $\Delta b$  -4.11  
 $\Delta C$  5.24  
 $\Delta h$  1.30  
 $\Delta E2000$  1.26

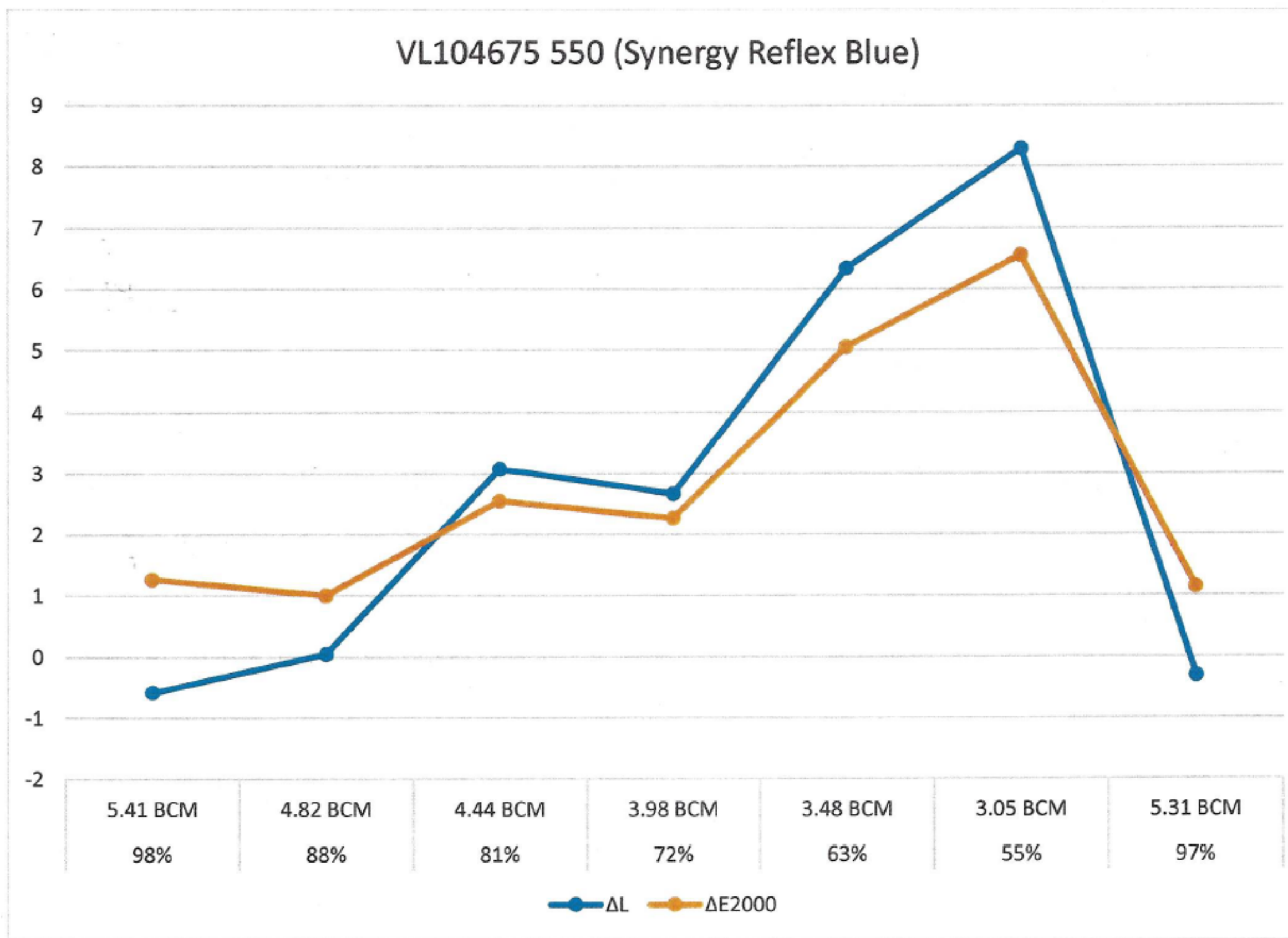
88%  
 $\Delta L$  0.04  
 $\Delta a$  2.85  
 $\Delta b$  -3.79  
 $\Delta C$  4.64  
 $\Delta h$  0.87  
 $\Delta E2000$  1.00

81%  
 $\Delta L$  3.07  
 $\Delta a$  0.43  
 $\Delta b$  -3.55  
 $\Delta C$  3.42  
 $\Delta h$  -0.92  
 $\Delta E2000$  2.55

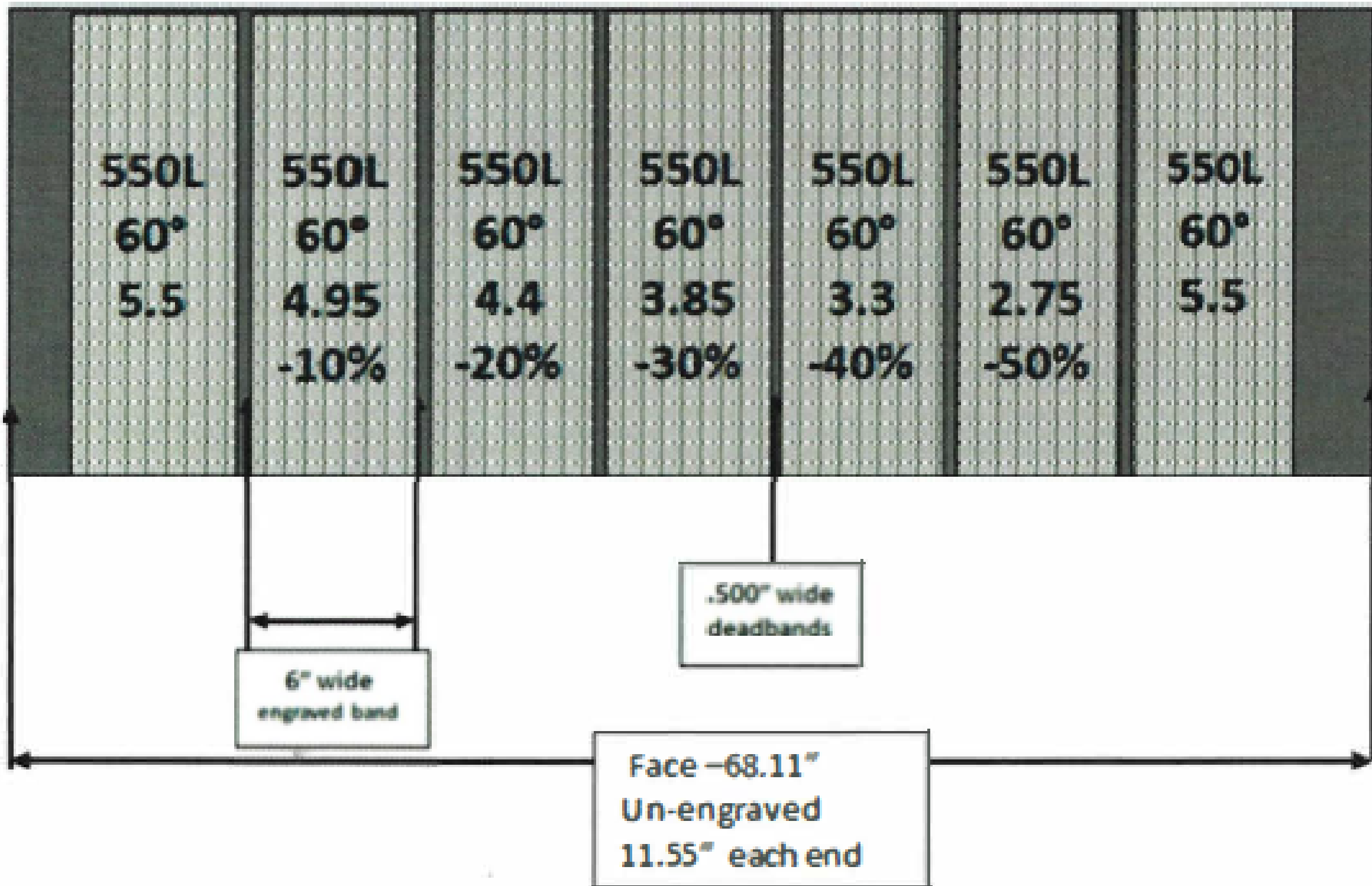
72%  
 $\Delta L$  2.66  
 $\Delta a$  0.93  
 $\Delta b$  -3.84  
 $\Delta C$  3.89  
 $\Delta h$  -0.63  
 $\Delta E2000$  2.26

63%  
 $\Delta L$  6.34  
 $\Delta a$  -2.04  
 $\Delta b$  -2.74  
 $\Delta C$  1.72  
 $\Delta h$  -2.63  
 $\Delta E2000$  5.05

55%  
 $\Delta L$  8.28  
 $\Delta a$  -3.59  
 $\Delta b$  -1.79  
 $\Delta C$  0.27  
 $\Delta h$  -3.60  
 $\Delta E2000$  6.55



## W & H Vistaflex Banded Roll



98%  
 $\Delta L$  -0.48  
 $\Delta a$  0.05  
 $\Delta b$  4.54  
 $\Delta C$  4.31  
 $\Delta h$  1.45  
 $\Delta E2000$  1.62

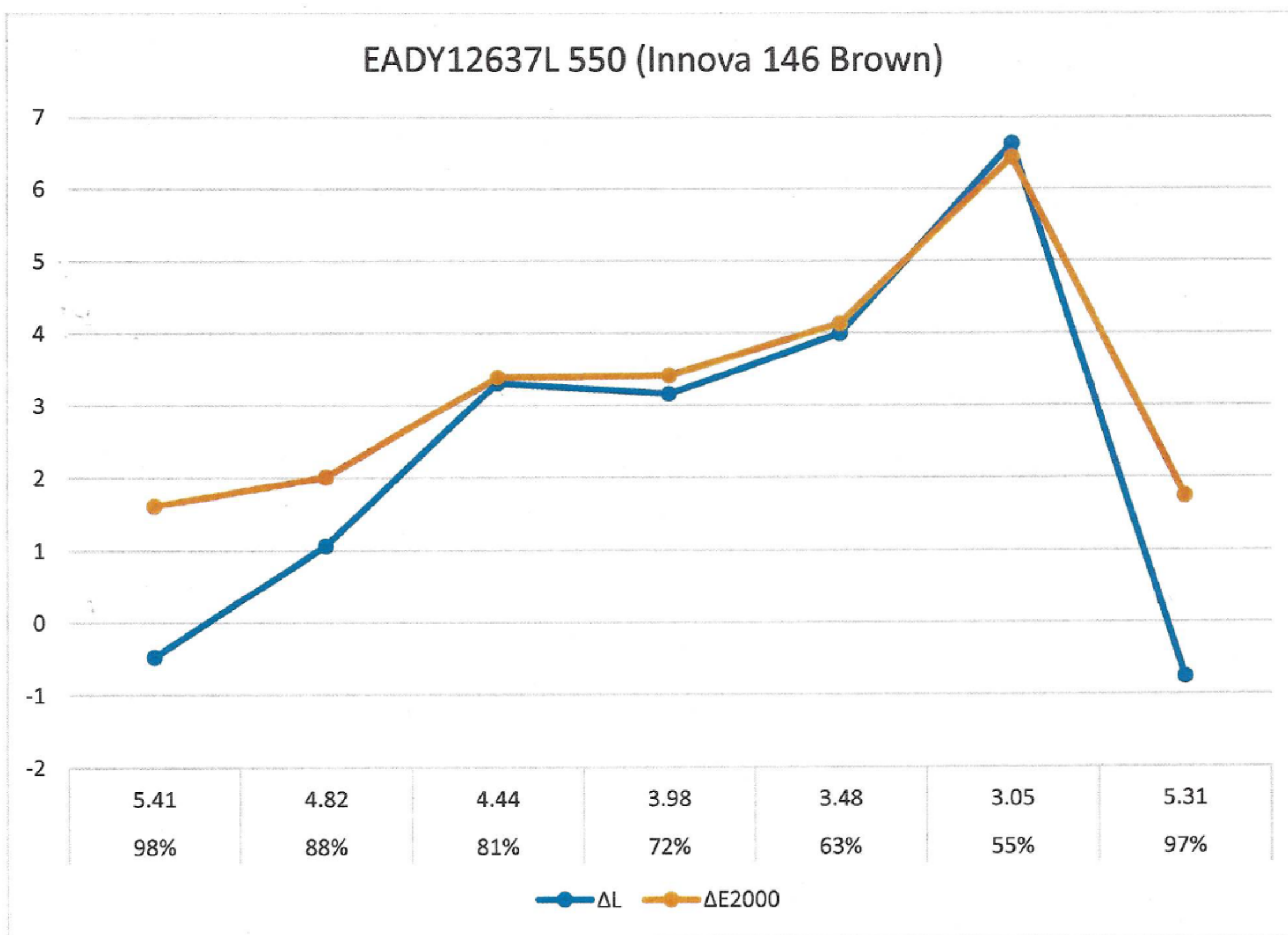
88%  
 $\Delta L$  1.06  
 $\Delta a$  -0.63  
 $\Delta b$  4.30  
 $\Delta C$  3.87  
 $\Delta h$  2.02  
 $\Delta E2000$  2.01

81%  
 $\Delta L$  3.31  
 $\Delta a$  -1.24  
 $\Delta b$  1.79  
 $\Delta C$  1.30  
 $\Delta h$  1.84  
 $\Delta E2000$  3.40

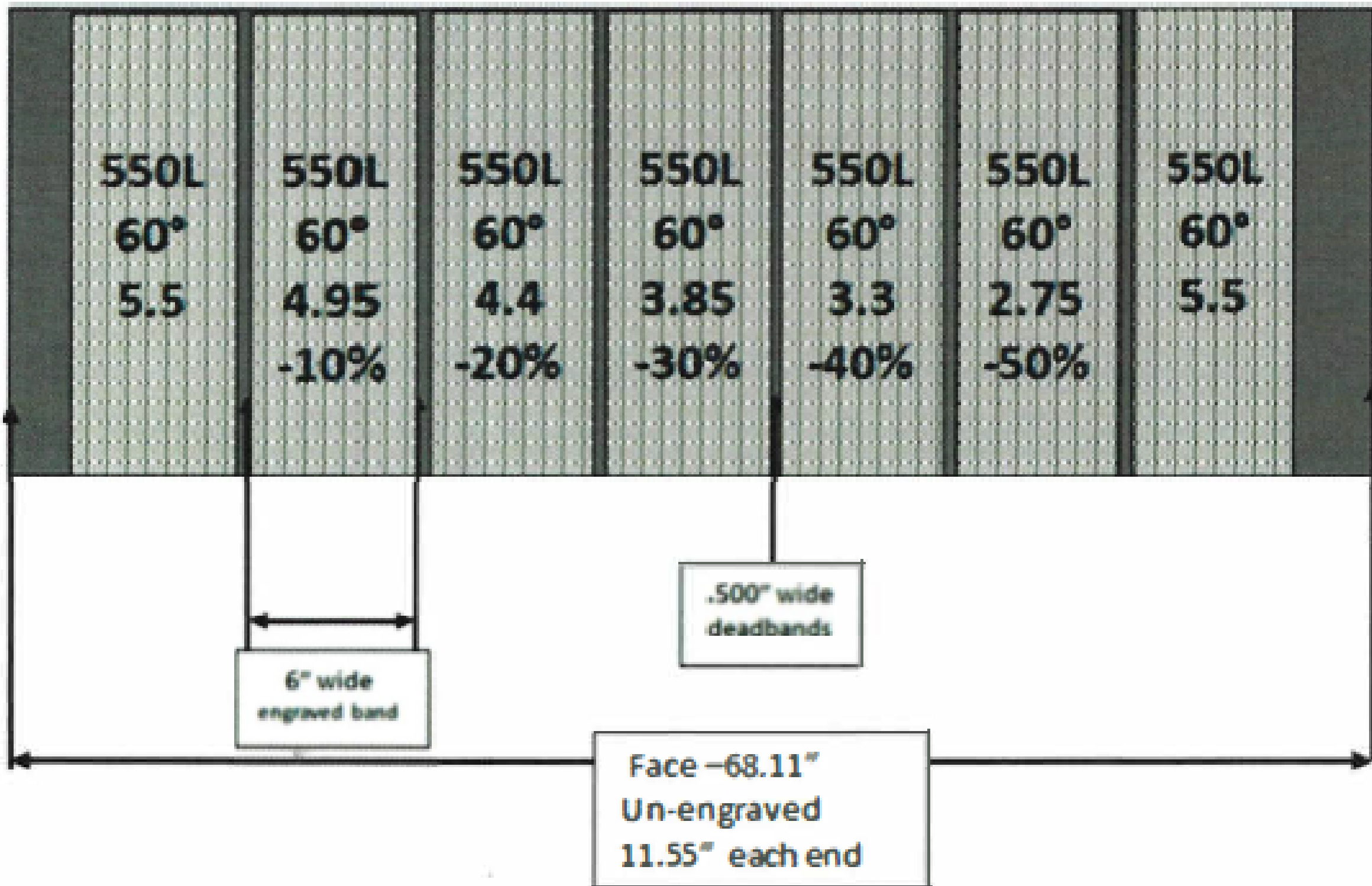
72%  
 $\Delta L$  3.16  
 $\Delta a$  -1.43  
 $\Delta b$  2.59  
 $\Delta C$  2.00  
 $\Delta h$  2.27  
 $\Delta E2000$  3.42

63%  
 $\Delta L$  3.99  
 $\Delta a$  -1.54  
 $\Delta b$  2.49  
 $\Delta C$  1.88  
 $\Delta h$  2.34  
 $\Delta E2000$  4.13

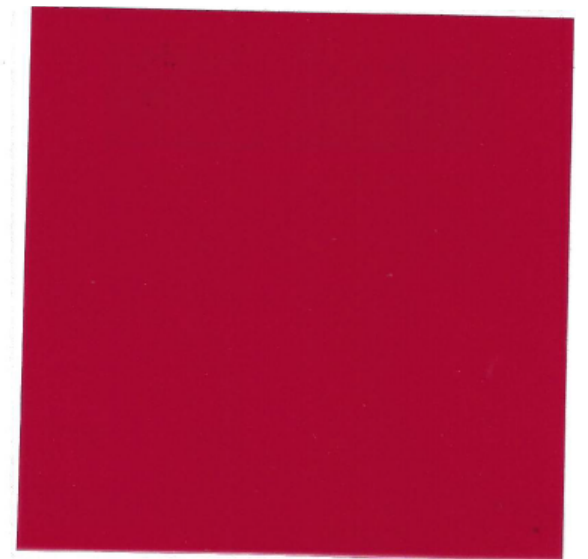
55%  
 $\Delta L$  6.62  
 $\Delta a$  -2.70  
 $\Delta b$  0.07  
 $\Delta C$  -0.78  
 $\Delta h$  2.76  
 $\Delta E2000$  6.43



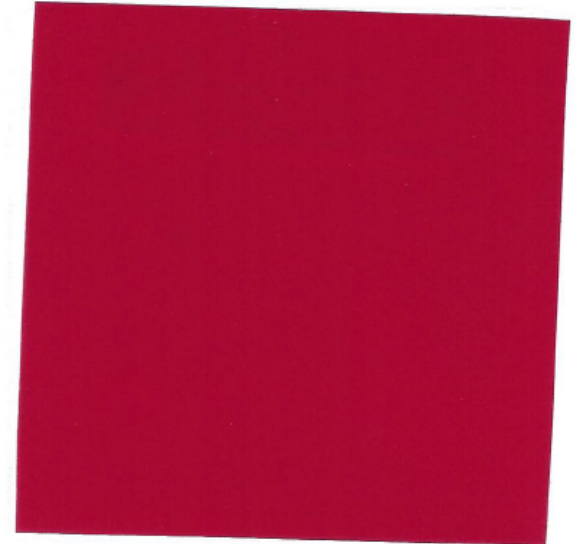
## W & H Vistaflex Banded Roll



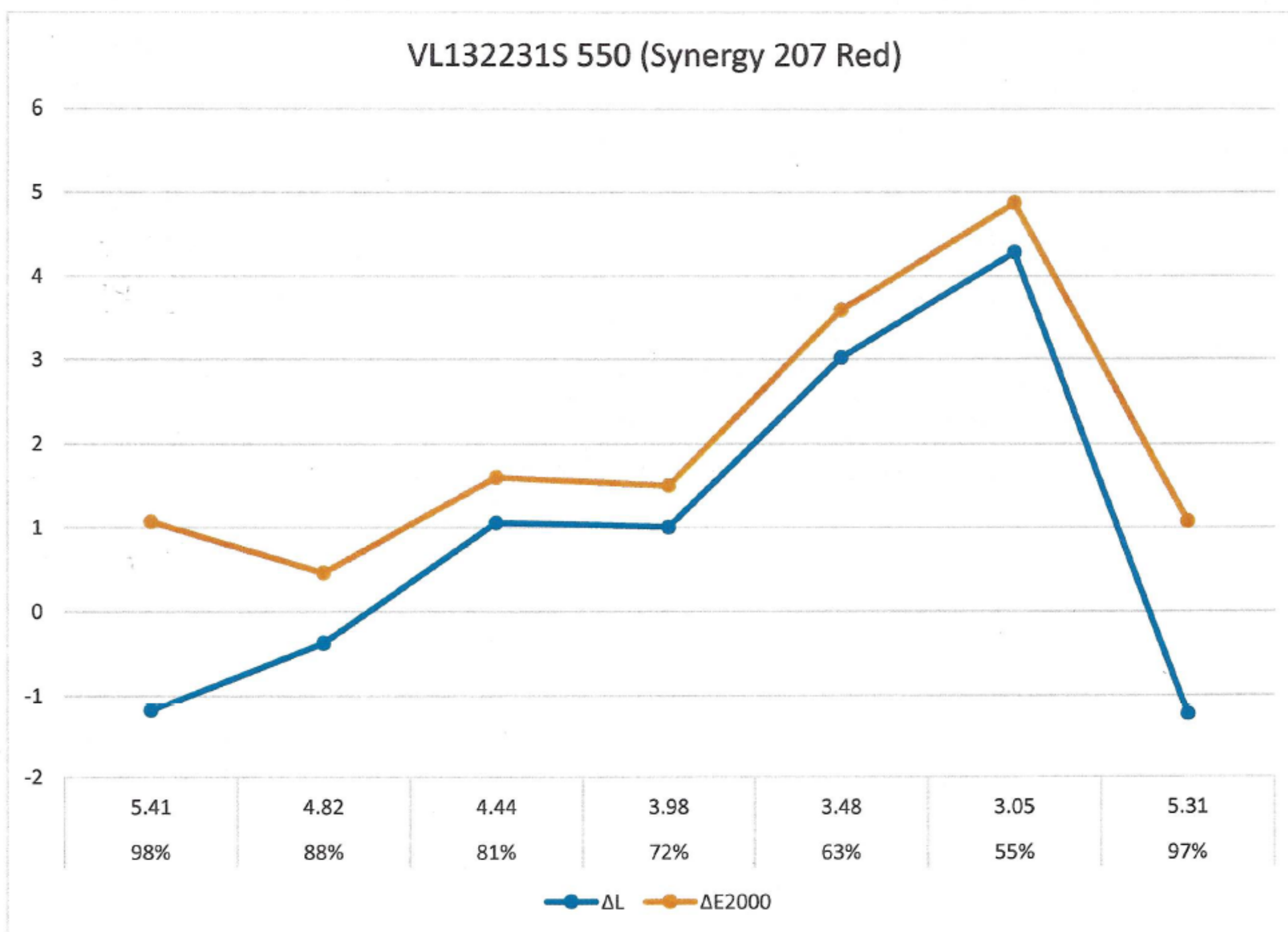
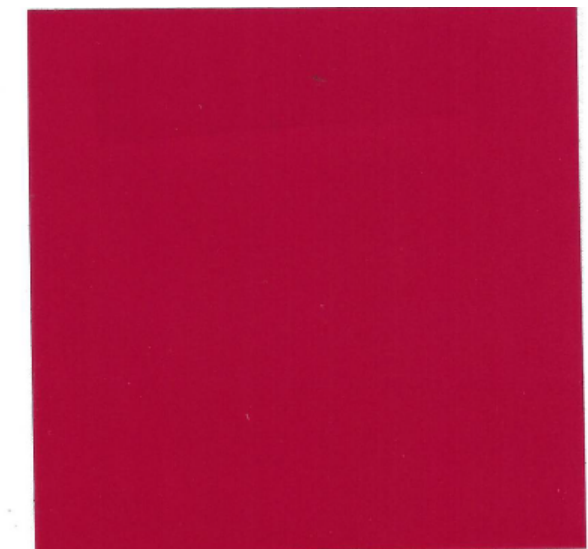
98%  
 $\Delta L$  -1.19  
 $\Delta a$  0.65  
 $\Delta b$  0.70  
 $\Delta C$  0.85  
 $\Delta h$  0.38  
 $\Delta E2000$  1.07



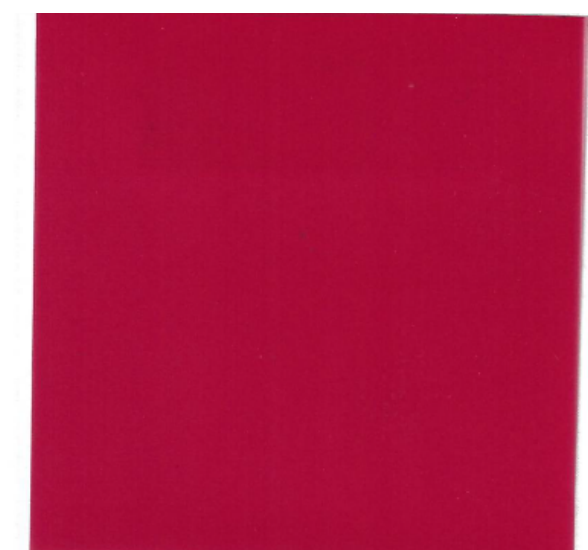
88%  
 $\Delta L$  -0.38  
 $\Delta a$  0.42  
 $\Delta b$  -0.50  
 $\Delta C$  0.23  
 $\Delta h$  -0.55  
 $\Delta E2000$  0.46



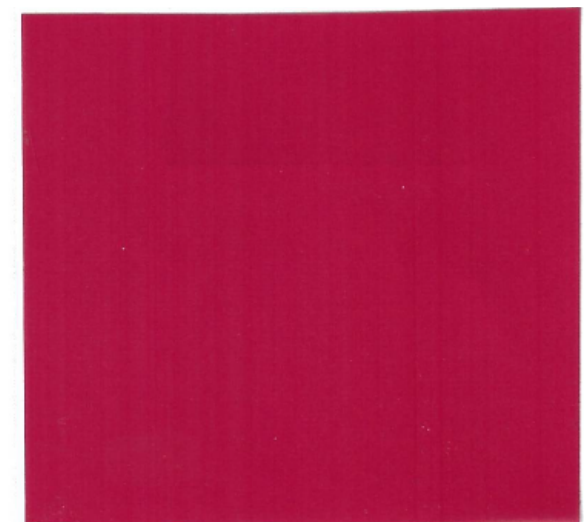
81%  
 $\Delta L$  1.05  
 $\Delta a$  0.10  
 $\Delta b$  -2.61  
 $\Delta C$  -0.74  
 $\Delta h$  -2.27  
 $\Delta E2000$  1.60



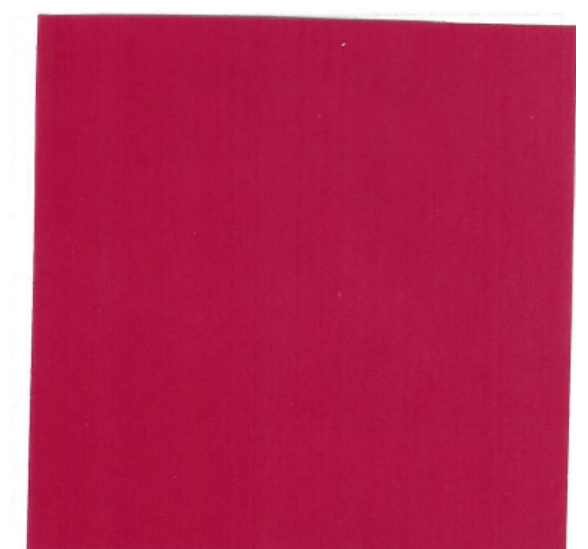
72%  
 $\Delta L$  1.00  
 $\Delta a$  0.11  
 $\Delta b$  -2.42  
 $\Delta C$  -0.67  
 $\Delta h$  -2.10  
 $\Delta E2000$  1.50



63%  
 $\Delta L$  3.02  
 $\Delta a$  -0.61  
 $\Delta b$  -4.96  
 $\Delta C$  -2.09  
 $\Delta h$  -4.14  
 $\Delta E2000$  3.59



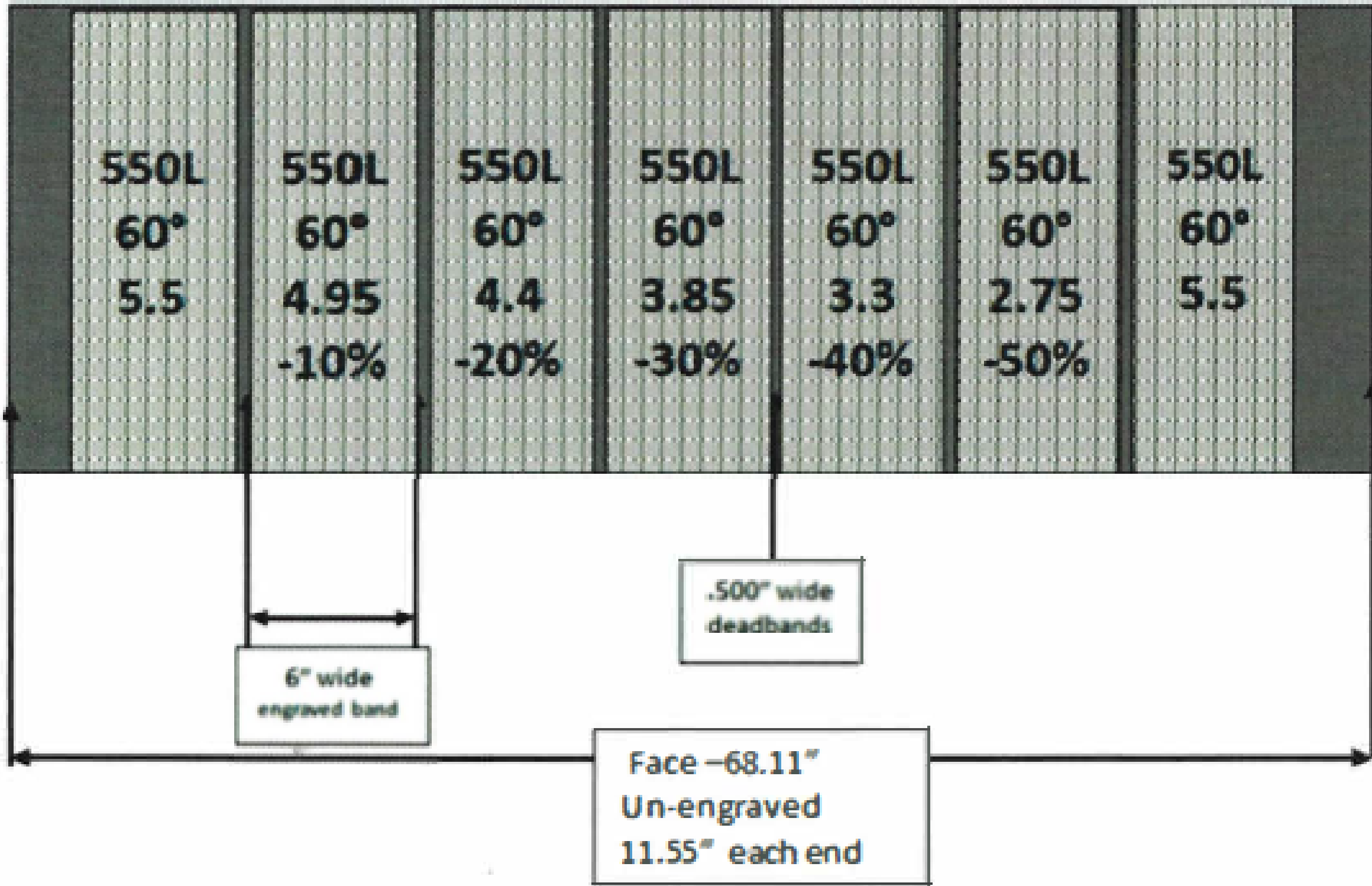
55%  
 $\Delta L$  4.28  
 $\Delta a$  -1.59  
 $\Delta b$  -6.37  
 $\Delta C$  -3.40  
 $\Delta h$  -5.17  
 $\Delta E2000$  4.87





# pamarco

## W & H Vistaflex Banded Roll



98%  
 $\Delta L$  -0.07  
 $\Delta a$  -3.91  
 $\Delta b$  0.62  
 $\Delta C$  3.85  
 $\Delta h$  -1.07  
 $\Delta E2000$  1.32

88%  
 $\Delta L$  1.50  
 $\Delta a$  -3.33  
 $\Delta b$  0.31  
 $\Delta C$  3.30  
 $\Delta h$  -0.68  
 $\Delta E2000$  1.73

81%  
 $\Delta L$  3.55  
 $\Delta a$  -2.14  
 $\Delta b$  0.00  
 $\Delta C$  2.13  
 $\Delta h$  -0.22  
 $\Delta E2000$  3.31

72%  
 $\Delta L$  4.80  
 $\Delta a$  -1.41  
 $\Delta b$  -0.09  
 $\Delta C$  1.41  
 $\Delta h$  -0.05  
 $\Delta E2000$  4.44

63%  
 $\Delta L$  6.09  
 $\Delta a$  -0.74  
 $\Delta b$  -0.10  
 $\Delta C$  0.74  
 $\Delta h$  0.04  
 $\Delta E2000$  5.67

55%  
 $\Delta L$  7.14  
 $\Delta a$  -0.16  
 $\Delta b$  -0.19  
 $\Delta C$  0.18  
 $\Delta h$  0.20  
 $\Delta E2000$  6.70

