TAGA NextGen

Effects of Paper Properties on Color Gamut of Dry-Toner Electrophotography

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Agenda

- Advantages of Electrophotography (EP)
- Objectives
- Experiments
- Results
- Conclusions

Advantages of Electrophotography (EP)

- Digital printing – ideal for short-run production and on-demand publishing
- Low maintenance – requires less frequent cleaning and servicing
- Reliable performance – provides consistent output with minimal downtime
- Versatile media compatibility – works with a variety of papers and synthetics

Objectives

- Compare color gamut of a dry-toner EP press between different paper substrates
- Study the effects of paper properties on color gamut
- Make paper recommendations for dry-toner EP

Paper Substrates

Brand	Manufacture	Type	Weight (gsm)
Tango Digital Cover	WestRock	C1S	195
Everyday Digital	Mohawk	C2S	270
Sterling Gloss Cover	Verso	C2S	216
Kromekote Gloss Cover	CPI Paper	C1S	170
Platinum Digital	Navigator	Uncoated	90
Bold Digital	Xerox	Uncoated	105
Cougar Text	Domtar	Uncoated	118

Paper Testing

- Structural properties
  - Thickness: TMI digital thickness gauge
  - Roughness and permeance: TMI Parker Print-Surf (PPS) device with a clamping pressure of 1000 kPa
- Optical properties
  - Gloss: Technidyne GM247 glossmeter at 75°
  - CIE L*a*b*, whiteness index, yellowness index, brightness, and OBA content: Techkon SpectroDens spectrophotometer at D50/2 or status T

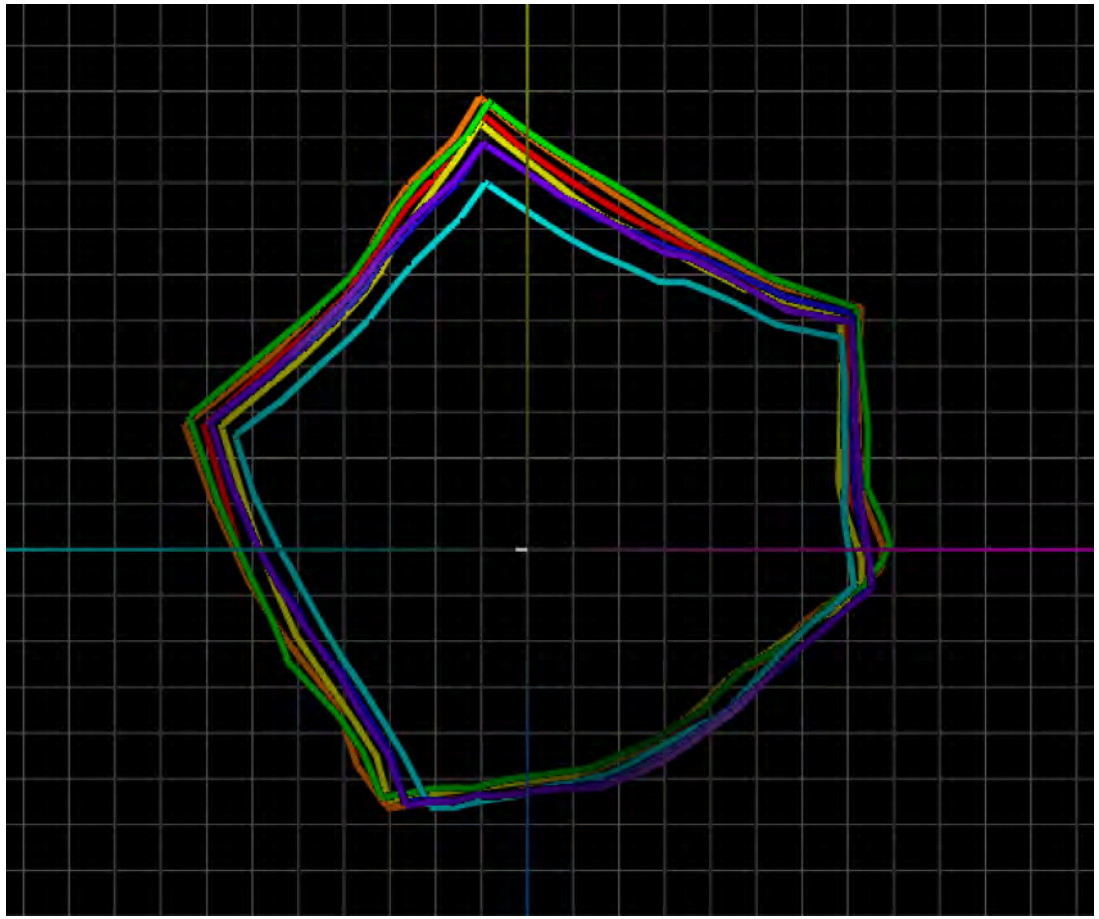
EP Press

- Konica Minolta AccurioPress C2070
- EFI Fiery™ Command Station 6.8
- EFI Fiery™ Color Profiler Suite 5.0
- Inline IQ-501 Intelligent Quality Optimizer

Profiling Process

- CMYK calibration
- G7 gray balance calibration
  - P2P51 target
- ICC profiling
  - CGATS IT8.7/4
  - 1,617 patches
- Profile analysis
  - CHROMiX ColorThink™ Pro 3.0.9

ICC Profiles

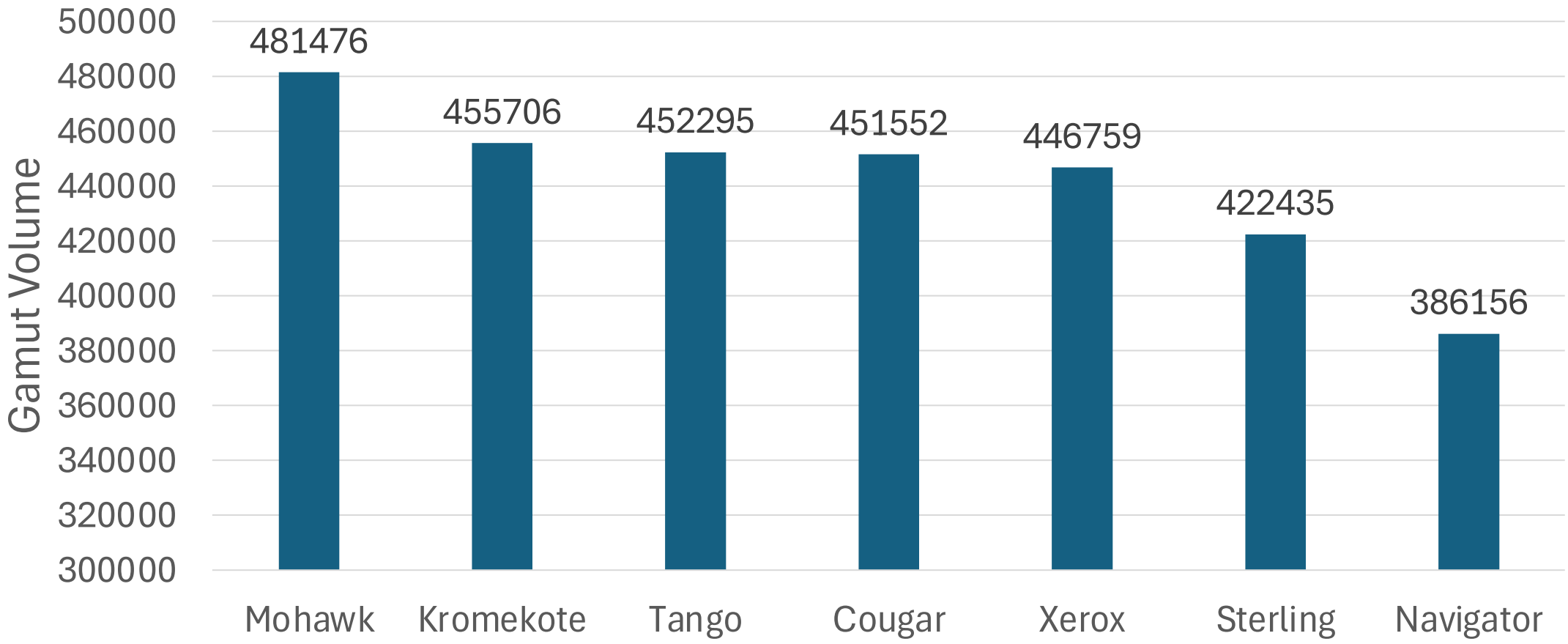


Red: Tango
Orange: Mohawk
Yellow: Sterling
Green: Kromekote
Cyan: Navigator
Blue: Xerox
Purple: Cougar

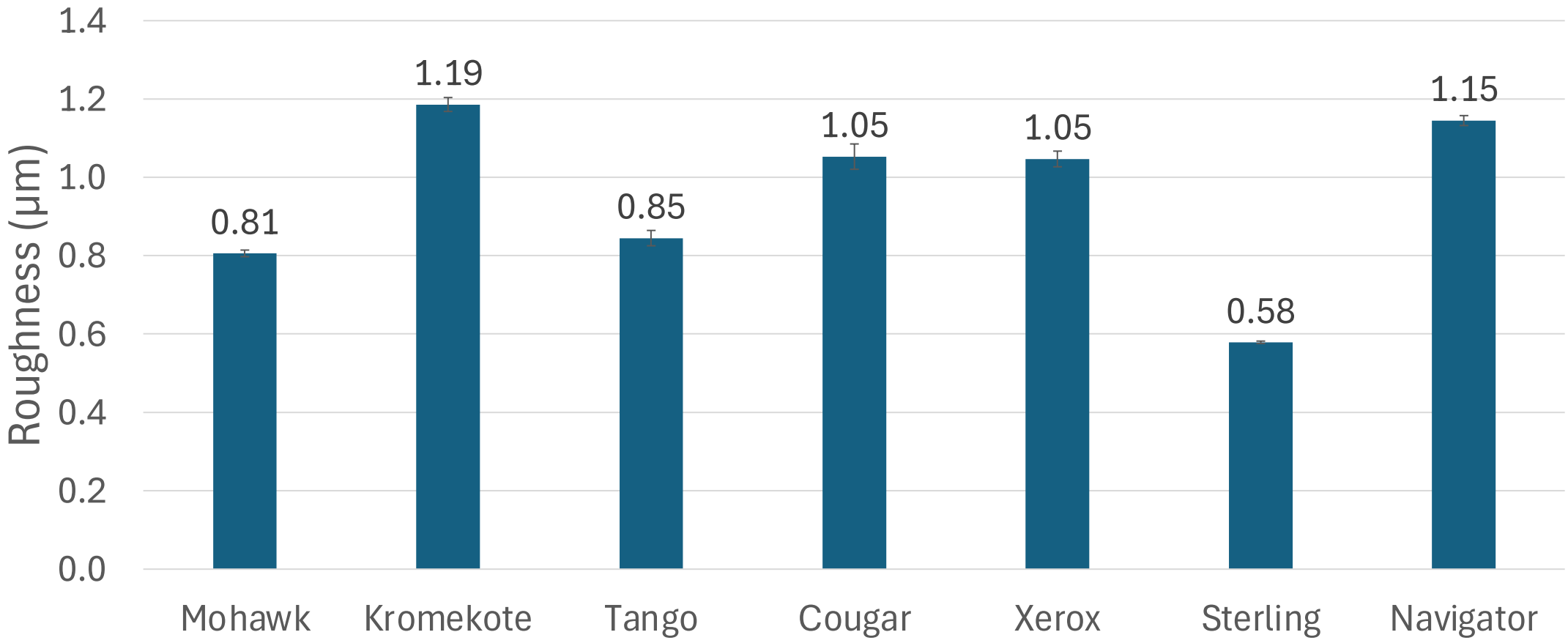
Gamut Volume

Substrate	Gamut Volume
Tango Digital Cover	452,295
Mohawk Everyday Digital	481,476
Sterling Gloss Cover	422,435
Kromekote Gloss Cover	455,706
Navigator Platinum Digital	386,156
Xerox Bold Digital	446,759
Cougar Text	451,552

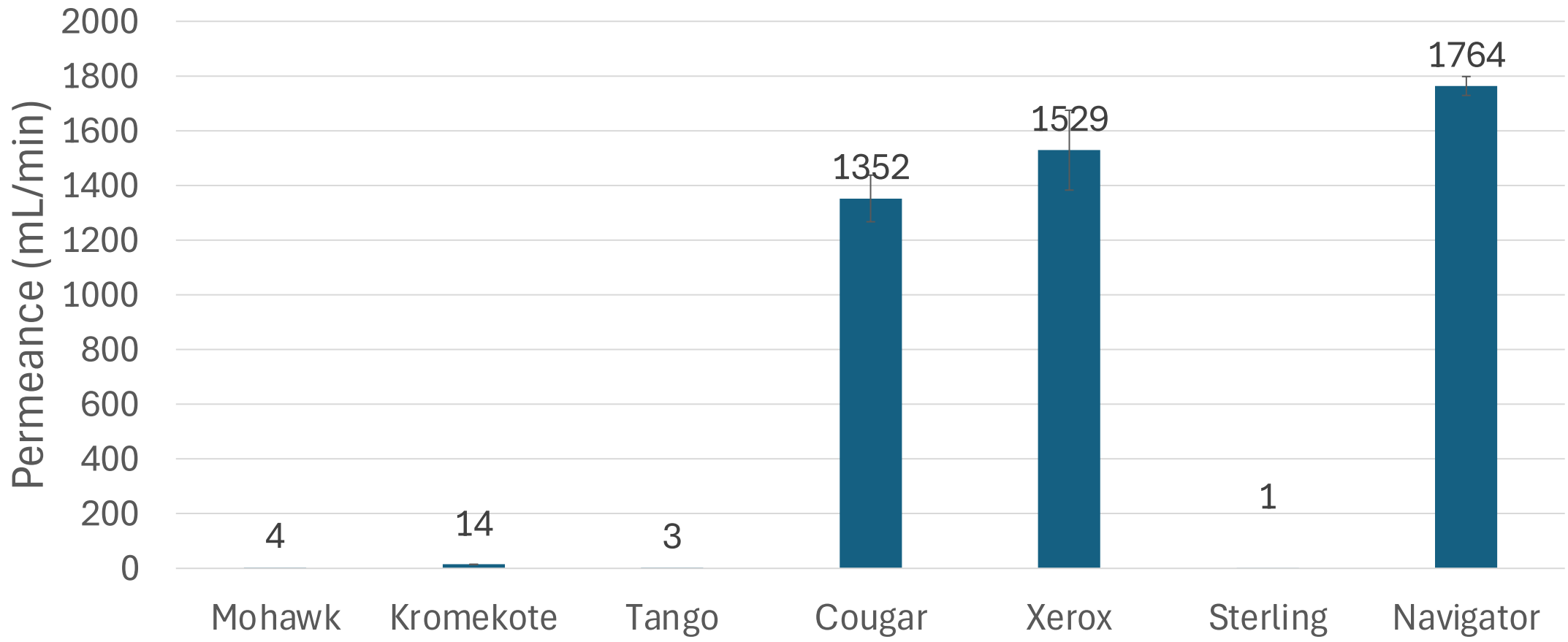
Gamut Volume



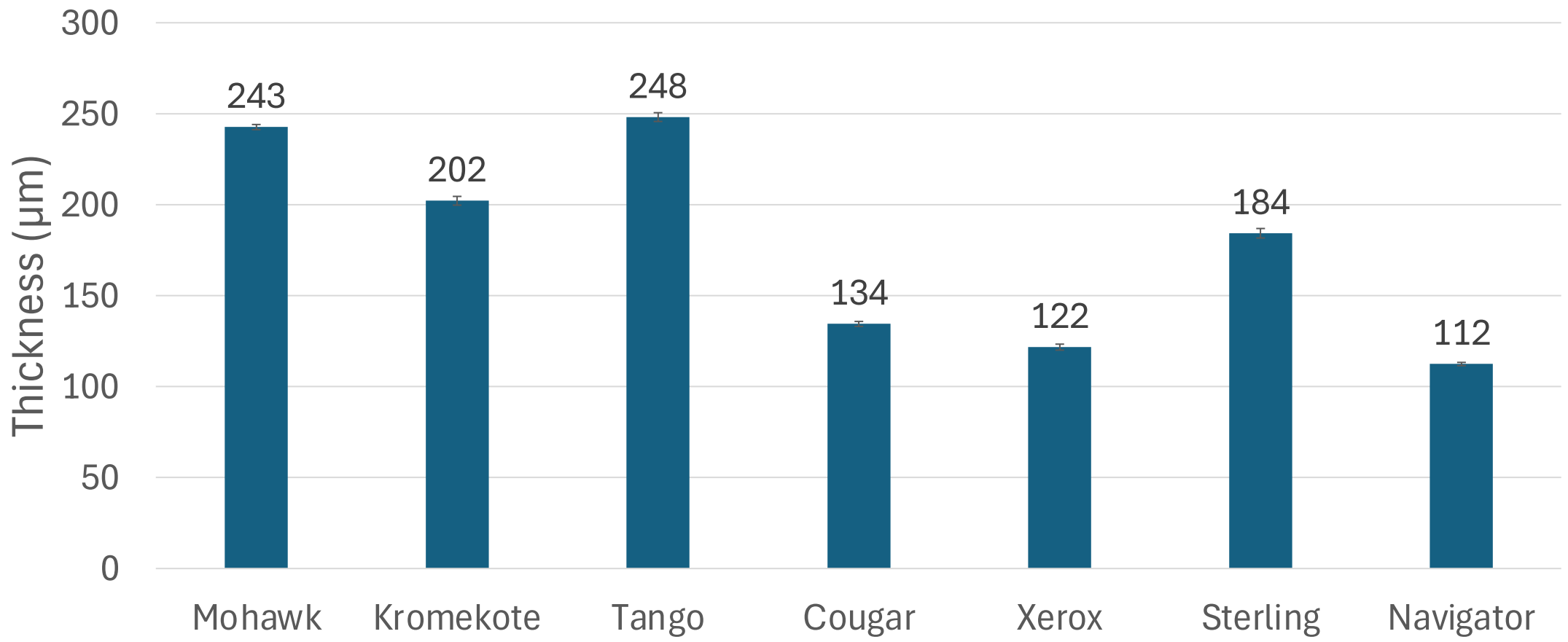
Surface Roughness



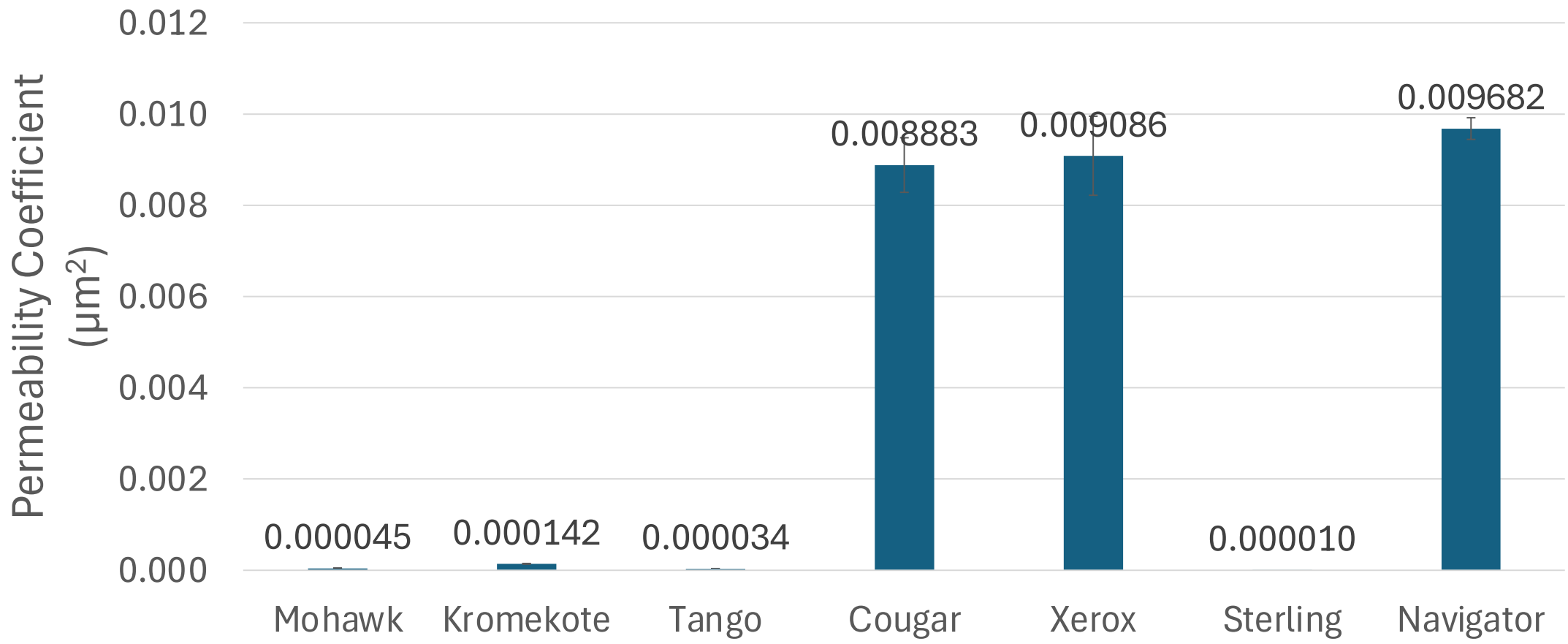
Permeance


Permeance (mL/min)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
4
14
3
1352
1529
1
1764
Mohawk
Kromekote
Tango
Cougar
Xerox
Sterling
Navigator

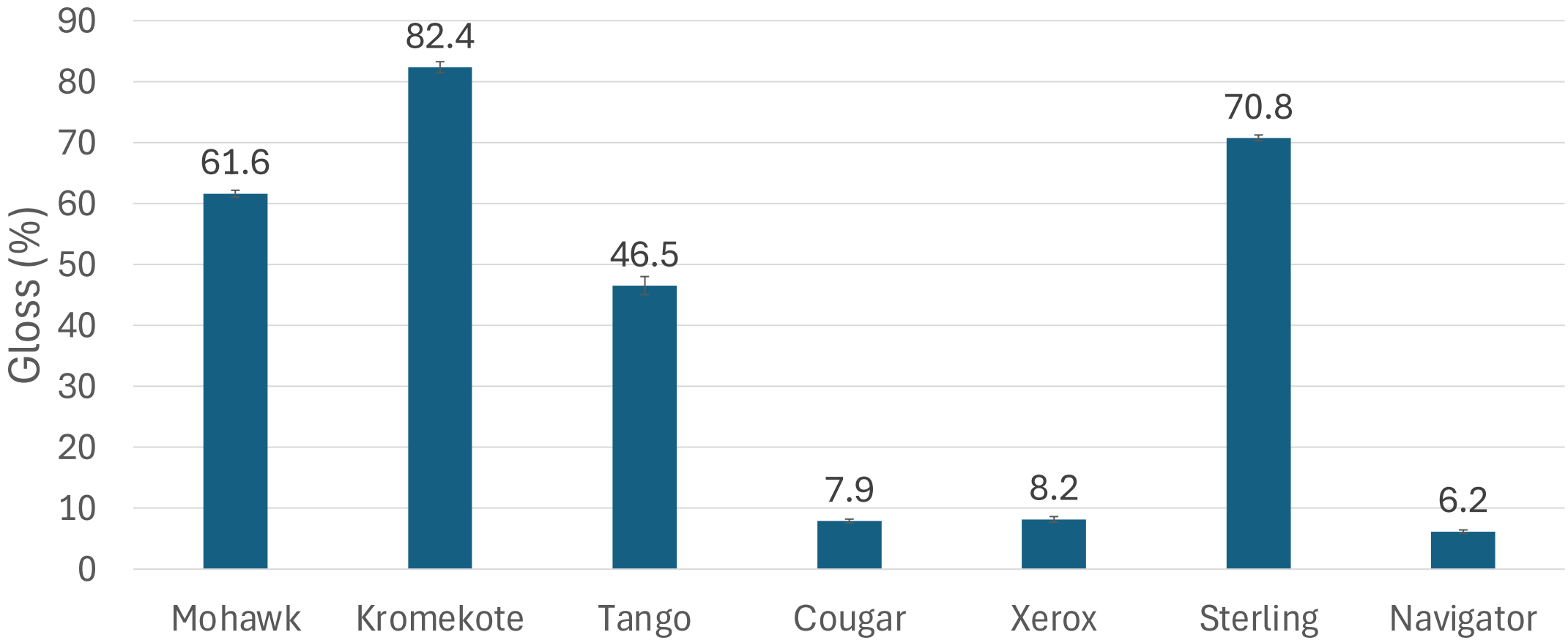
Paper Thickness



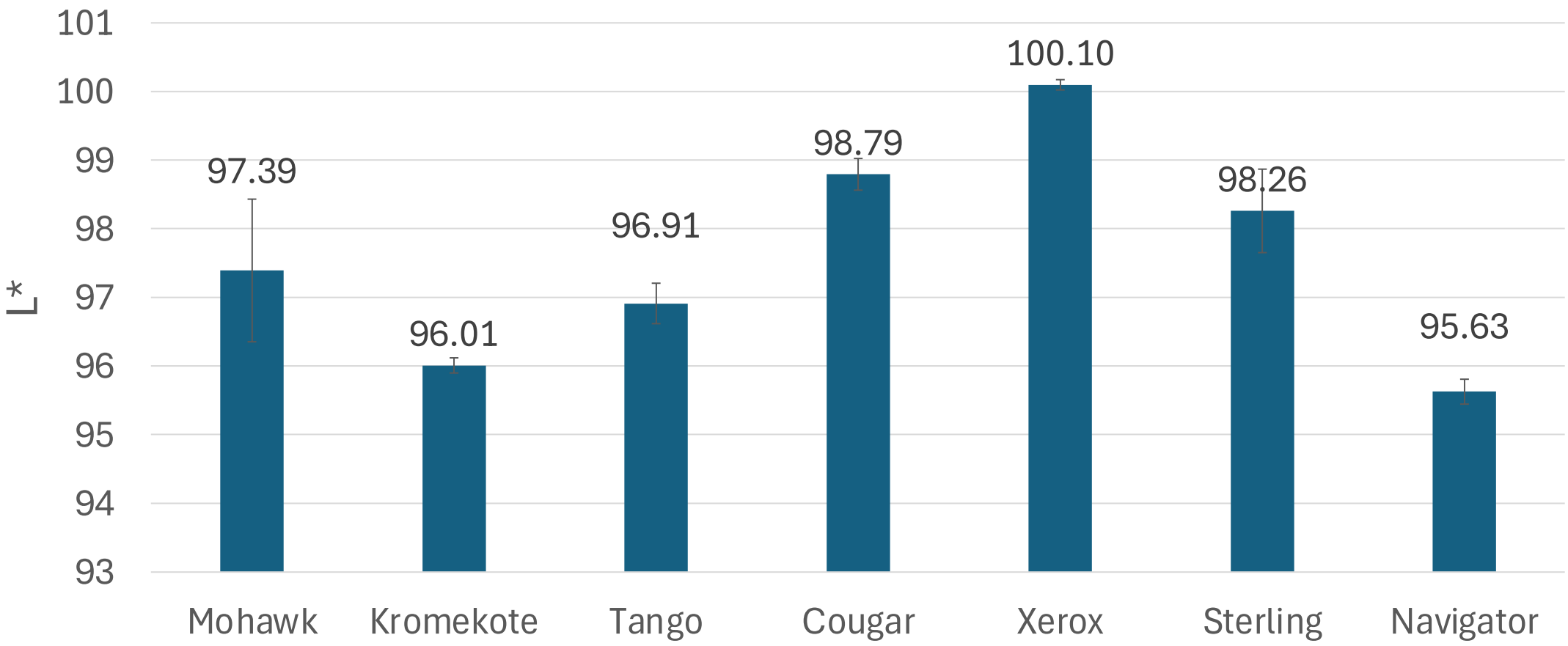
Permeability Coefficient



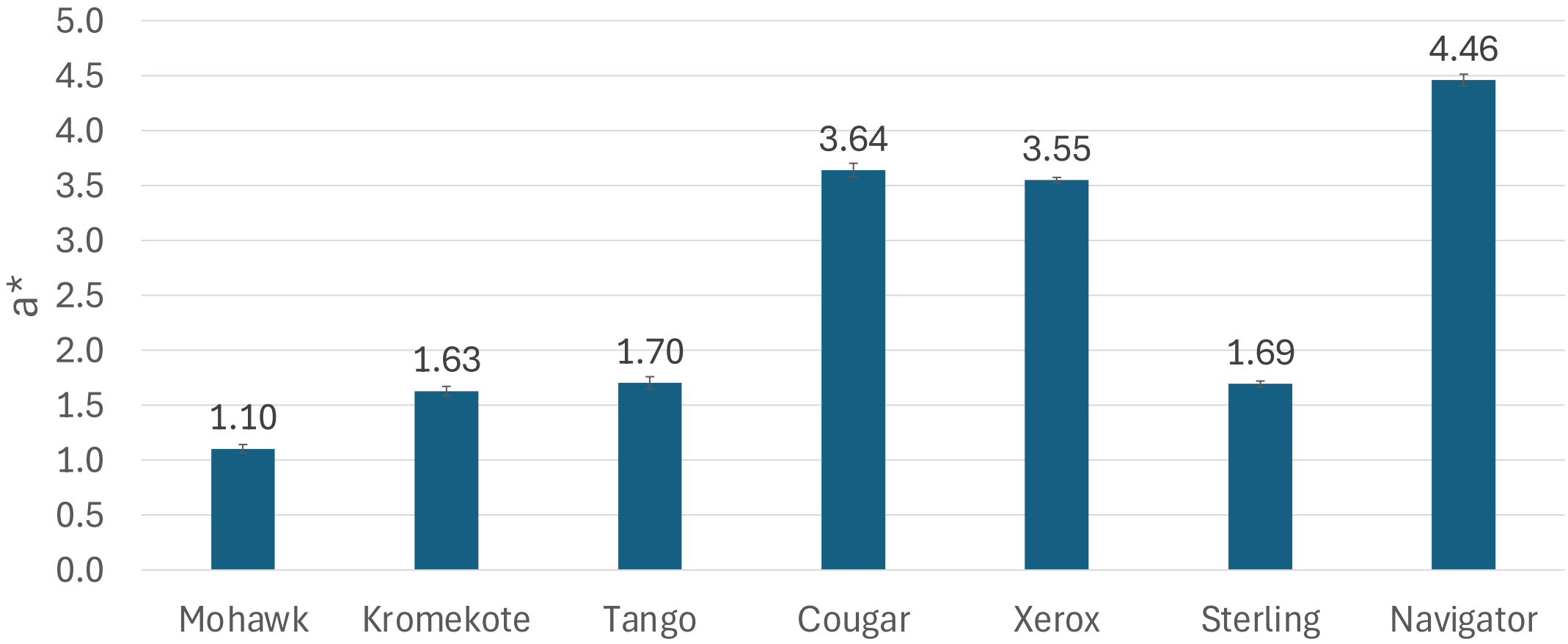
Gloss at 75°


Gloss (%)
90
80
70
60
50
40
30
20
10
0
61.6
82.4
46.5
7.9
8.2
70.8
6.2
Mohawk
Kromekote
Tango
Cougar
Xerox
Sterling
Navigator

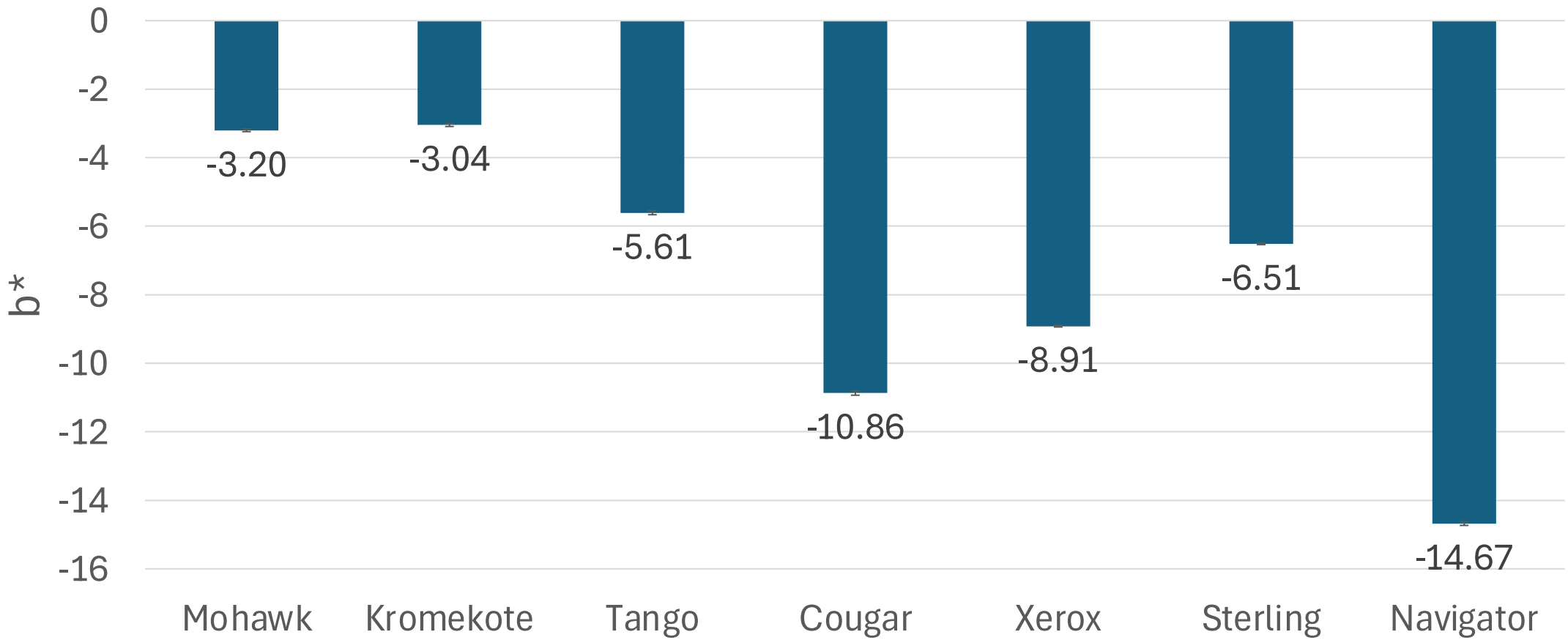
L*


101
100
99
98
97
96
95
94
93
L*
97.39
96.01
96.91
98.79
100.10
98.26
95.63
Mohawk
Kromekote
Tango
Cougar
Xerox
Sterling
Navigator

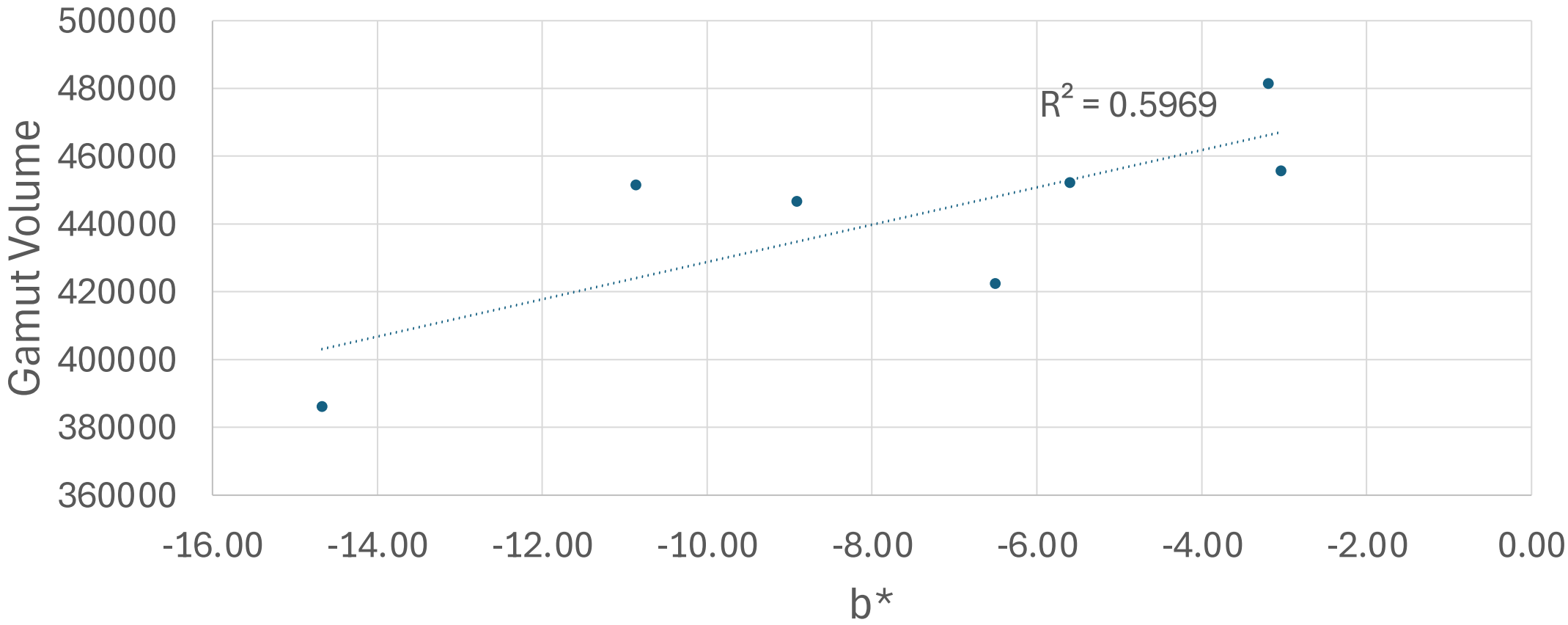
a*


5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
a*
1.10
1.63
1.70
3.64
3.55
1.69
4.46
Mohawk
Kromekote
Tango
Cougar
Xerox
Sterling
Navigator

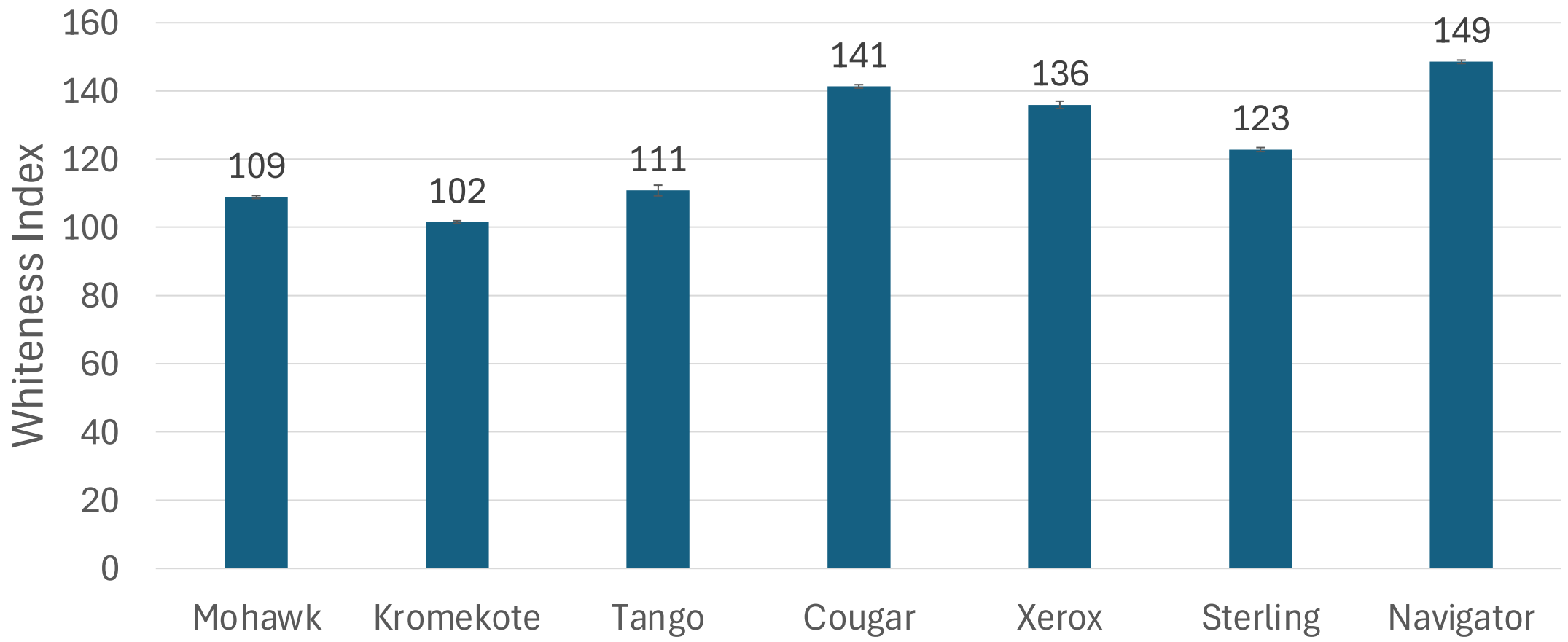
b*


b*
0
-2
-4
-6
-8
-10
-12
-14
-16
-3.20
-3.04
-5.61
-10.86
-8.91
-6.51
-14.67
Mohawk
Kromekote
Tango
Cougar
Xerox
Sterling
Navigator

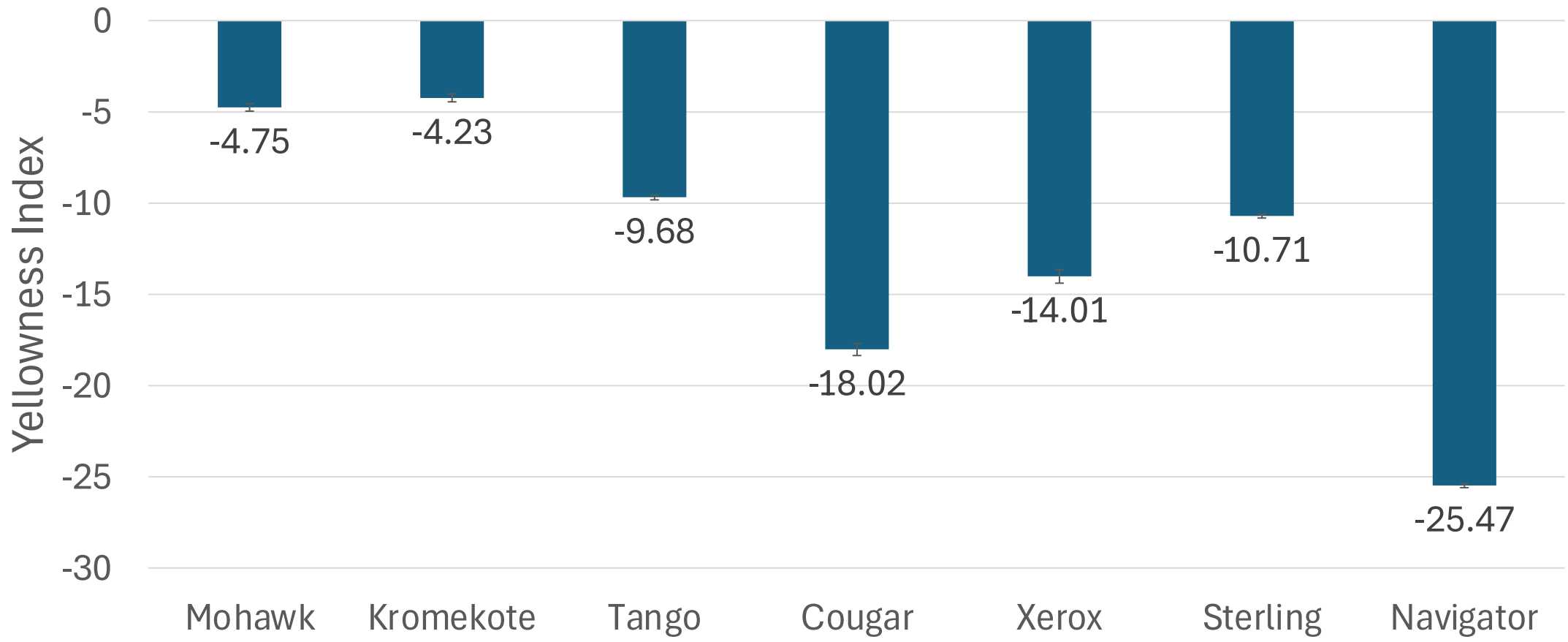
Gamut Volume vs. b*



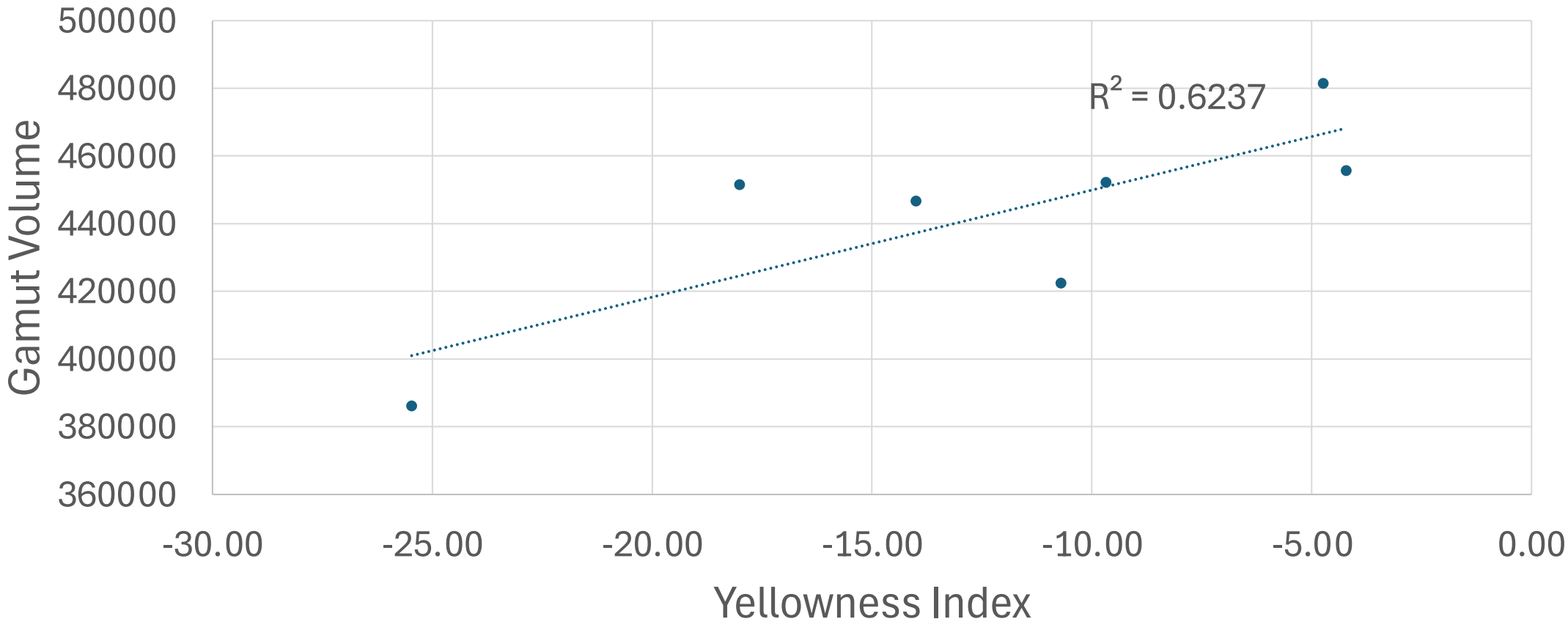
Whiteness Index



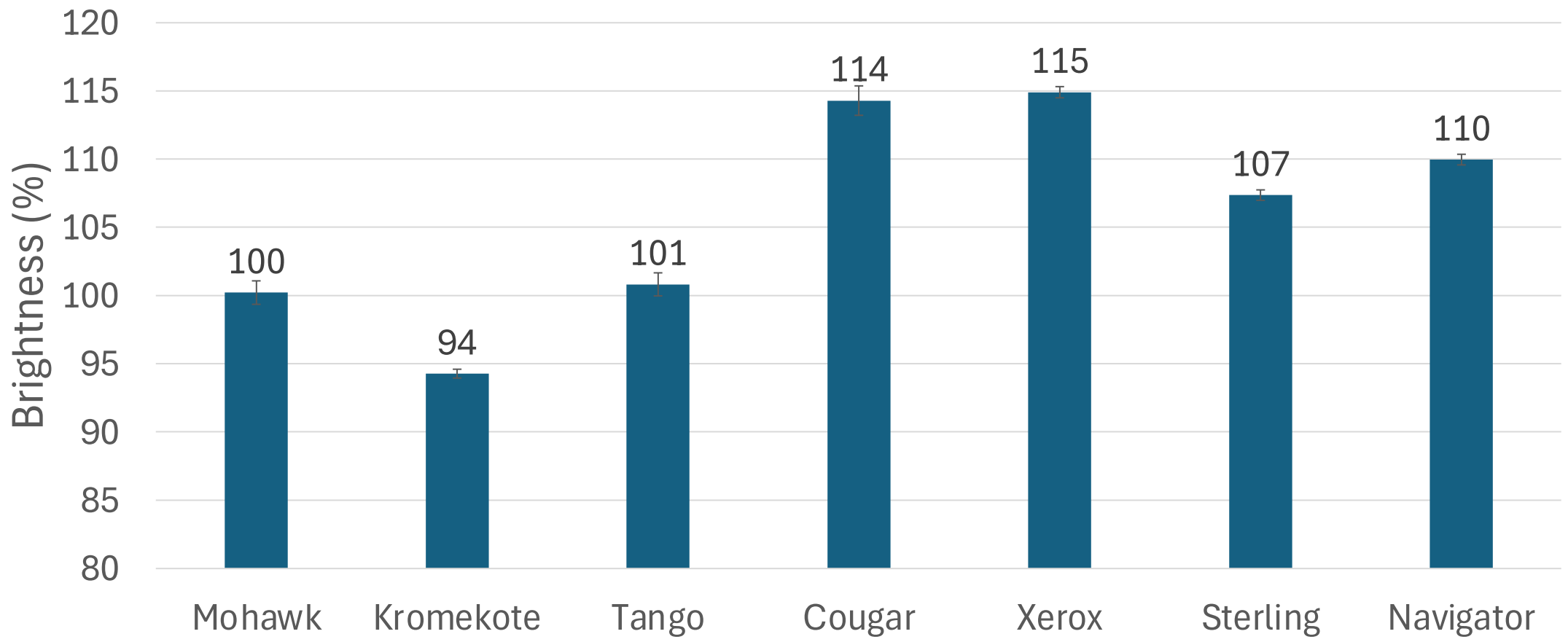
Yellowness Index (Cast)



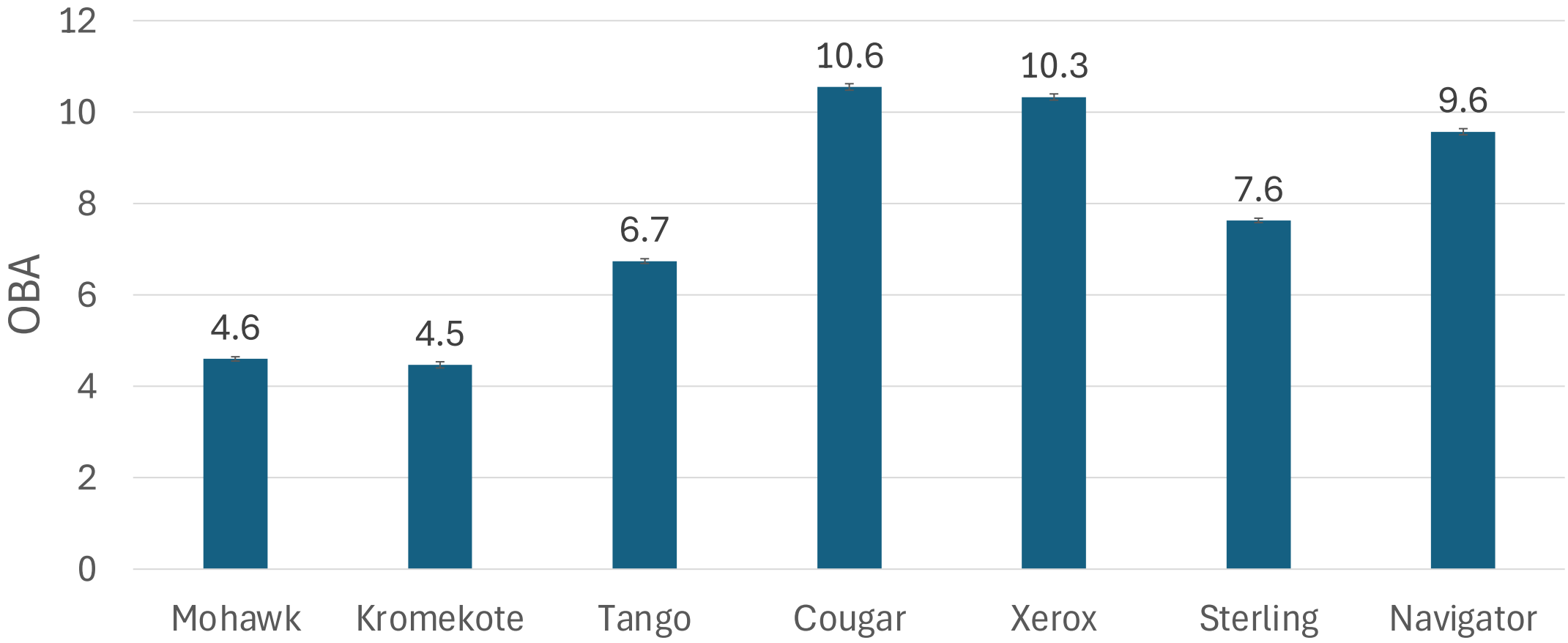
Gamut Volume vs. Yellowness Index



Brightness


120
115
110
105
100
95
90
85
80
Brightness (%)
100
94
101
114
115
107
110
Mohawk
Kromekote
Tango
Cougar
Xerox
Sterling
Navigator

OBA


OBA
12
10
8
6
4
2
0
4.6
4.5
6.7
10.6
10.3
7.6
9.6
Mohawk
Kromekote
Tango
Cougar
Xerox
Sterling
Navigator

Conclusions

- Optical properties affect color gamut of EP more than structural properties.
- Achieving a higher gamut volume of EP requires
  - Lower yellowness index and whiteness index
  - a* and b* (or chroma) closer to 0
  - Less OBA content and lower brightness
  - Lower permeability coefficient

Acknowledgement

- Konica Minolta

Thank you!

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