



New Gel Coat Technologies

ArmorFlex® 99F

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- Advanced technology for improved toughness
- User friendly, polyester based gel coat
- Available in white and off-white
- Low HAP for the marine and composite industry



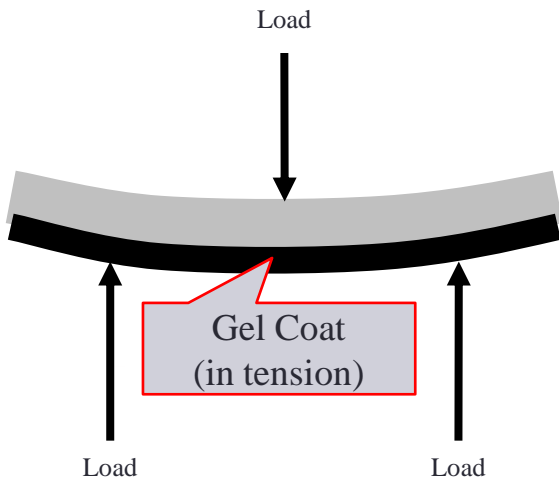
ArmorFlex® 99F

Feature		Benefit
Enhanced toughness	➔	Reduced cracking
Good UV resistance	➔	Reduced chalking and yellowing
Good water resistance	➔	Minimize osmotic blistering
Excellent spray ability and leveling	➔	Less over spray
Low backside tack	➔	Sharper Tapelines



ArmorFlex® 99F

- Crack Resistance – Flexure to First Crack
 - Panels fabricated by a boat builder using 16-20 mils of their baseline gel coat and ArmorFlex® 99F.
 - Specimens tested in Flexure (similar to ASTM D790)
 - Test stopped at first audible crack



Flexure to First Crack Test Schematic

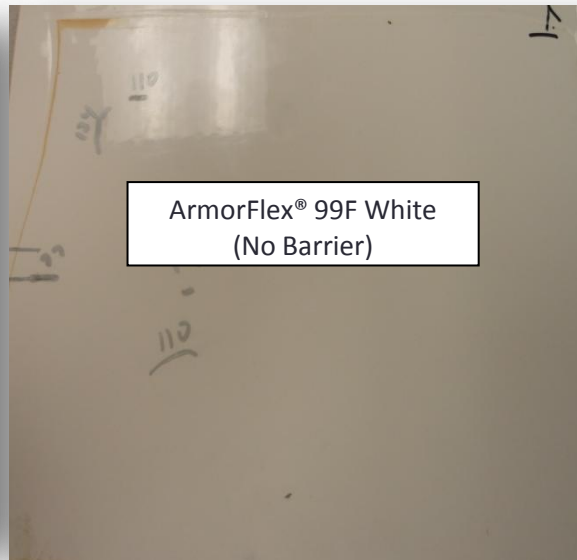


ArmorFlex® 99F



Crack Resistance – **Thermal Shock** (30 min. cycles each, at 71C to -34C)

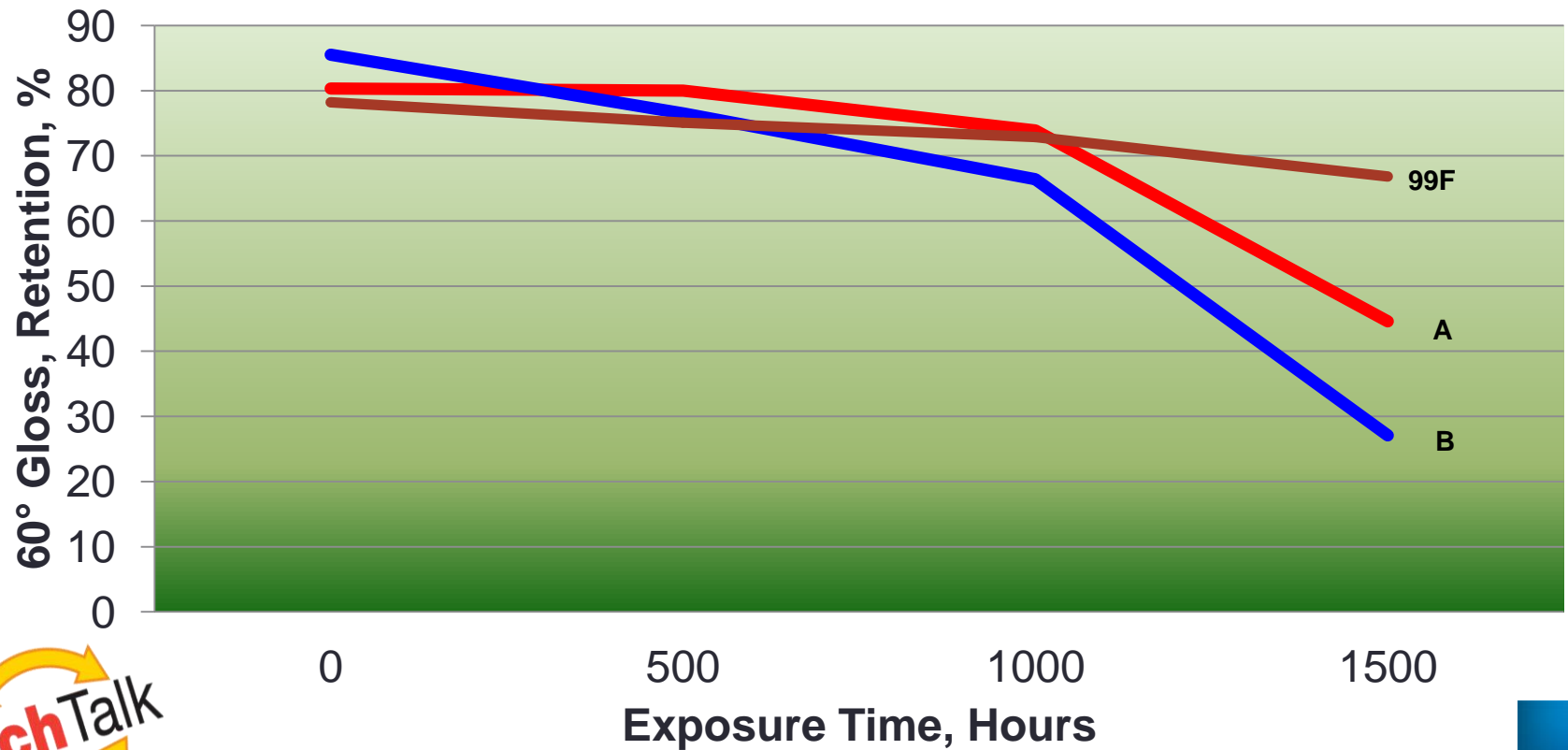
Gel Coat	Barrier Coat	Cycles to First Crack	Total Cycles	Total Number of Cracks
Commercial White Gel Coats	None	1-30	150	30-70
ArmorFlex® 99F White	None	60-80	150	1-6
ArmorFlex® 99F White	IMEDGE® HPB 210LK292 (50 mils)	298	300	2



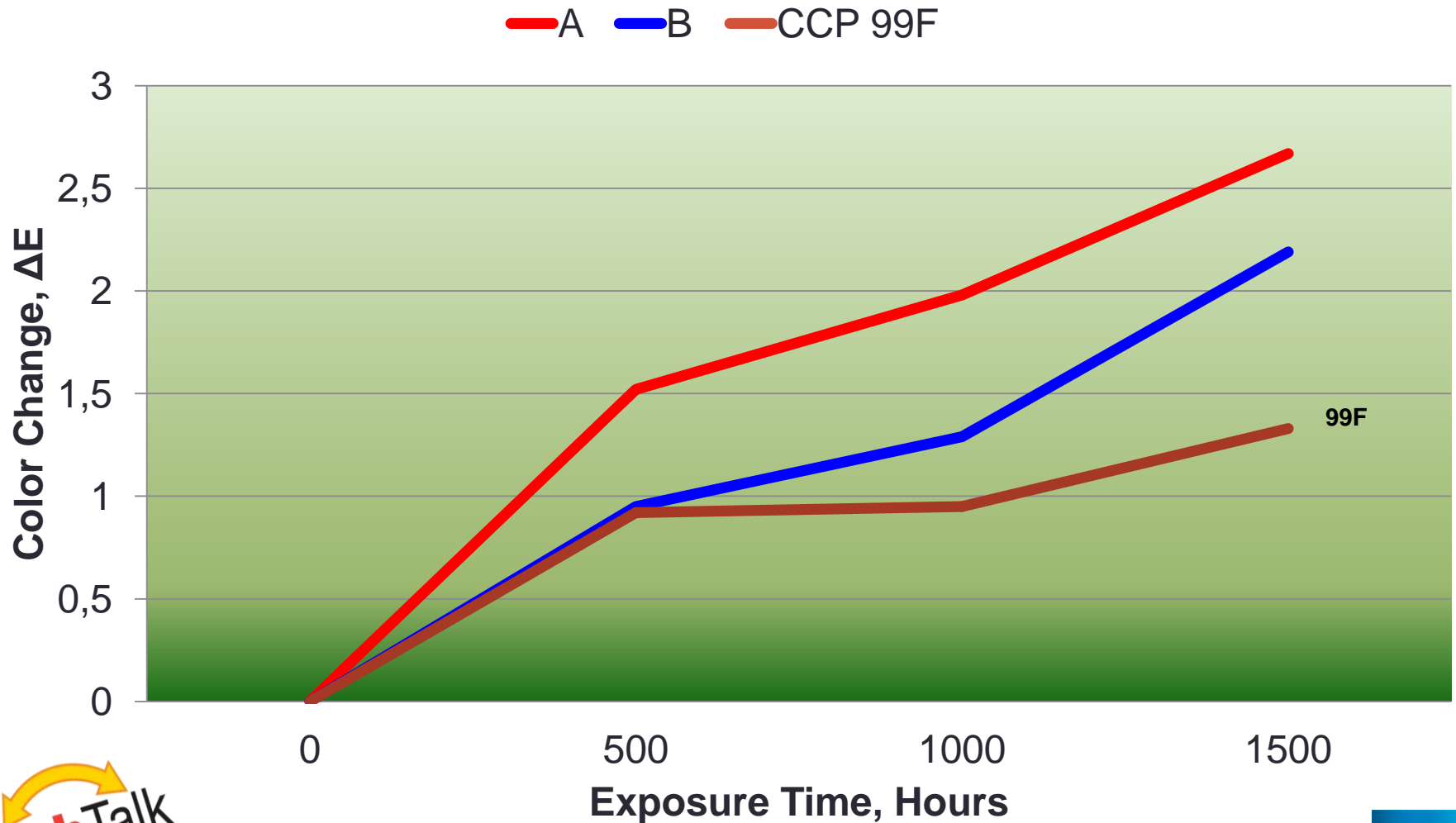
ArmorFlex[®] 99F

Accelerated QUV-A Weathering

— A — B — CCP 99F



ArmorFlex[®] 99F

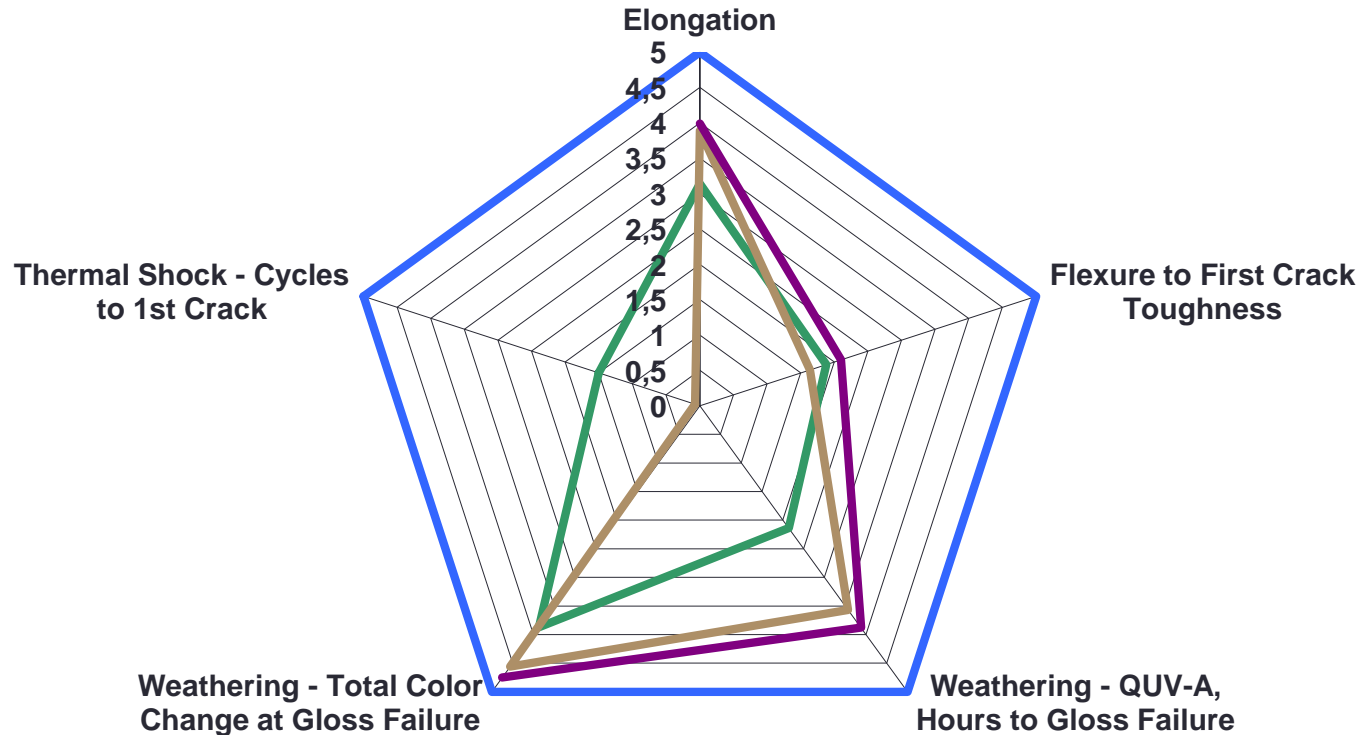


ArmorFlex® 99F



Competitive Benchmarking at CCP Composites

Performance of 99F vs. the Competition



Property	Valspar High Flex	Ashland LE	HK Revolution	ArmorFlex® 99F
Elongation, %	1.55	1.92	2.1	2.7
Flexure to First Crack Toughness	85	74	212	297
Weathering – QUV-A Hours to Gloss Failure	500-1000	1000-1500	1000-1500	1500-2000
Weathering – QUV-A Total Color Change at Gloss Failure	3.46	2.94	2.82	2.68
Thermal Shock – Cycles to 1 st Crack	21	1	Not Tested	70

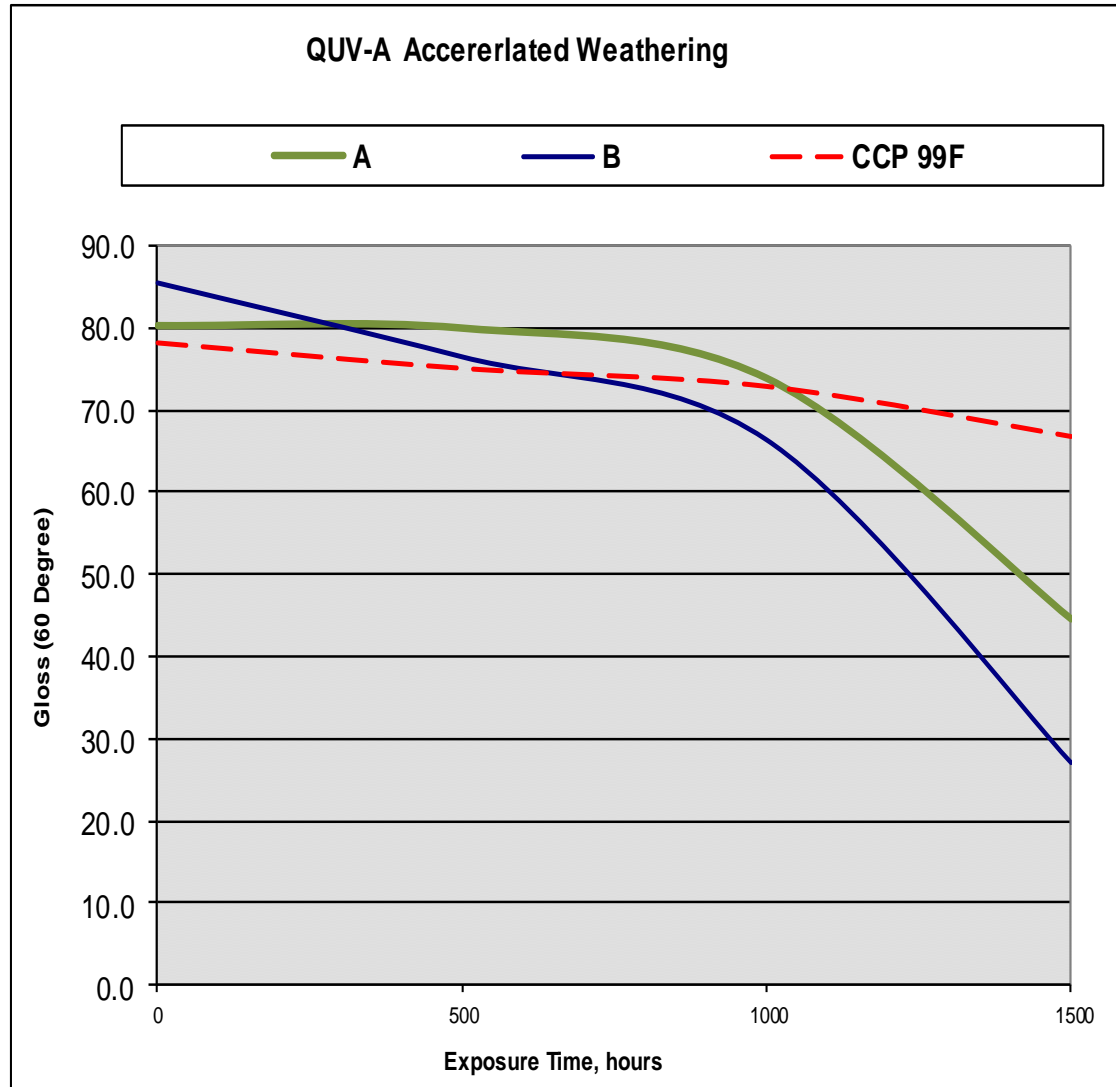
BLIND TESTING at CUSTOMER'S

QUV-A Resistance Results (60° gloss; Customer A)

Product Description	Hours			
	0	500	1000	1500
A	80.3	80	73.9	44.6
B	85.5	76.5	66.4	27.1
CCP 99F	78.2	75.1	72.9	66.8

C = CCP 99F

**A & B =
Ashland MaxGuard LE
HK Revolution**



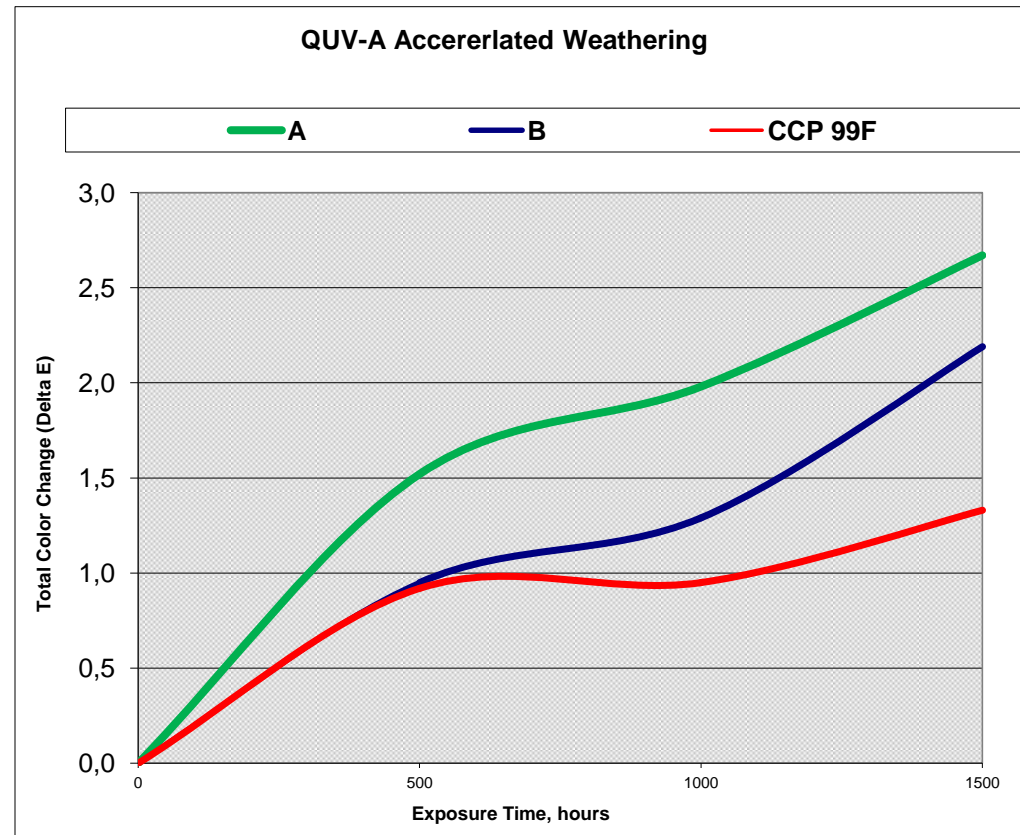
QUV-A Weathering Resistance –Results (DE color; Customer A)

Color Change after QUV-A Exposure

Product Description	Exposure Time (hours)			
	0	500	1000	1500
A	0.0	1.52	1.98	2.67
B	0.0	0.95	1.29	2.19
CCP 99F	0.0	0.92	0.95	1.33

C = CCP 99F

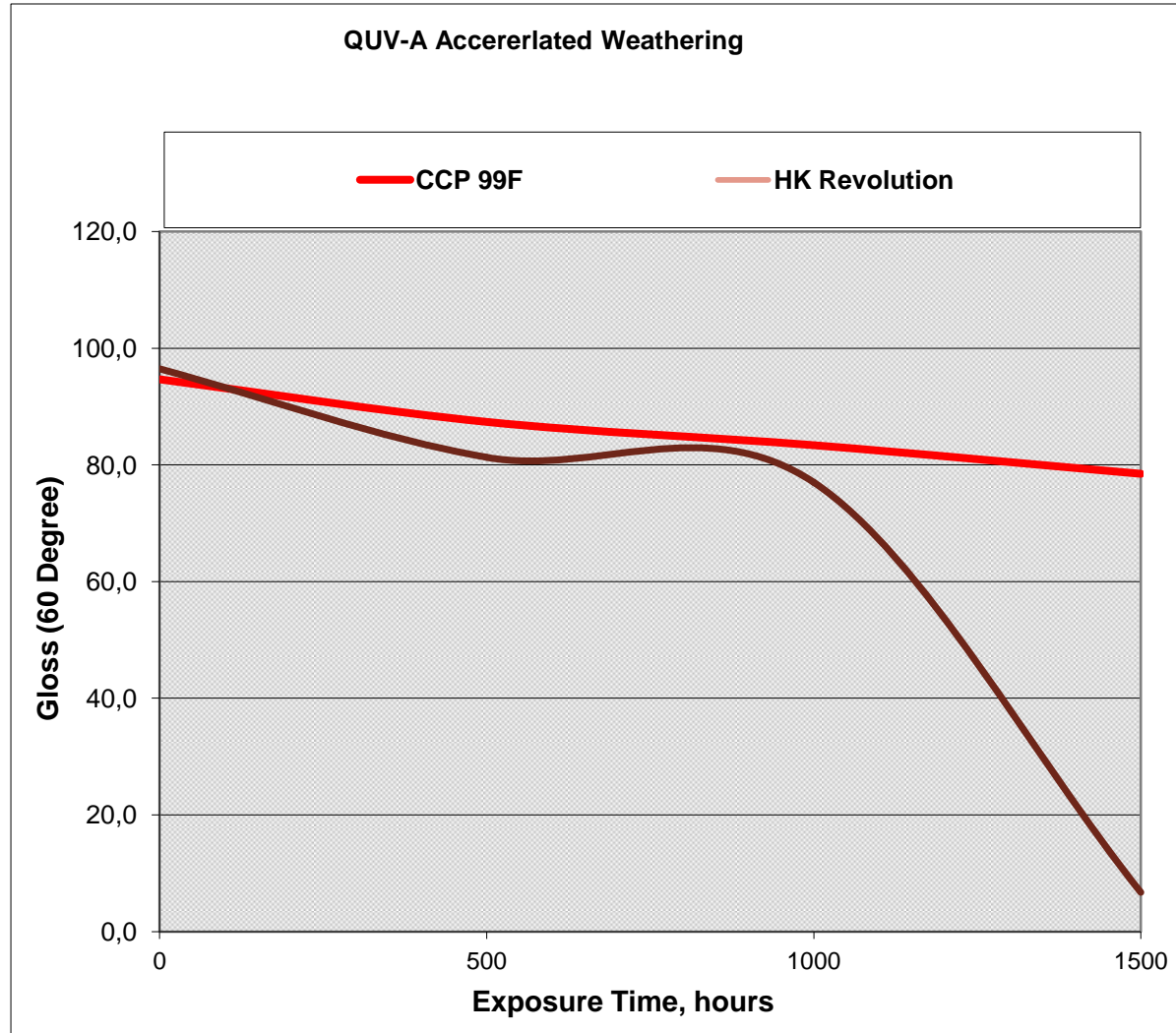
**A & B =
Ashland MaxGuard LE
HK Revolution**



QUV-A Resistance Results (60° gloss; Customer B)

Gloss (60°) after QUV-A Exposure

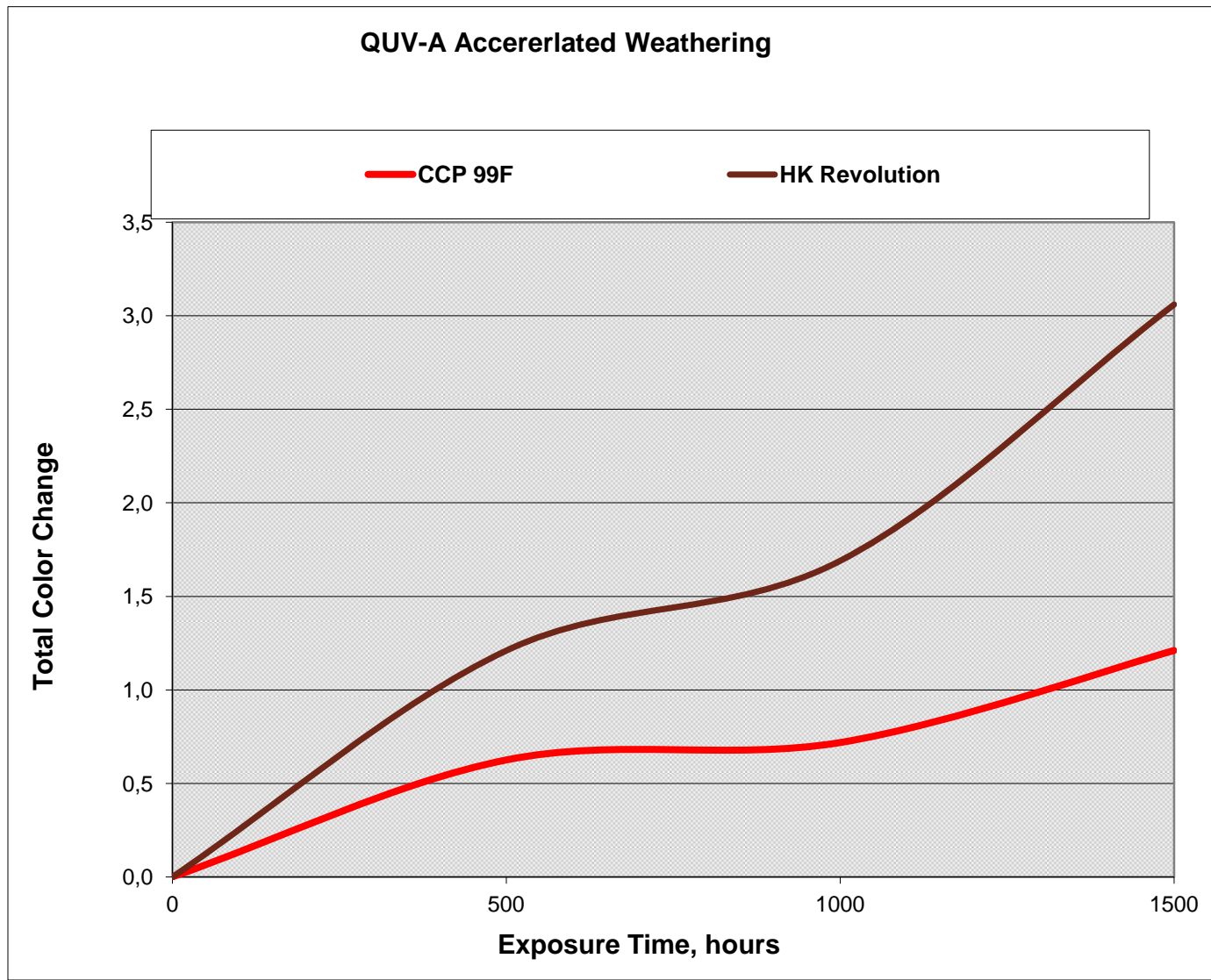
Product Description	Exposure Time (hours)			
	0	500	1000	1500
CCP 99F	94.7	87.4	83.4	78.5
HK Revolution	96.5	81.3	77	6.7



QUV-A Weathering Resistance –Results (DE color; Customer B)

Color Change (DE) after QUV-A Exposure 99F versus HK

Product Description	Exposure Time (hours)			
	0	500	1000	1500
CCP 99F	0.00	0.625	0.718	1.21
HK Revolution	0.00	1.21	1.69	3.06



WHY CHOOSE 99F ?

Superior Performance!

- Improved UV Resistance (QUV)
- Improved Gloss Retention (QUV)
- Improved Crack Resistance (Flexural to First Crack)
- Improved Thermal Shock
- Improved Toughness (High Elongation)
- Excellent Blister Resistance
- User Friendly in spray and patching

Ashland, HK and Valspar marine grade gel coats are challenged to meet the Superior Performance of Armor Flex 99F in internal CCP testing and in blind test performed at major marine manufactures.

