Mini Technical Report

Polyurea, Hybrid and Polyurethane QUV Accelerated Weather Testing

Mini Technical Report | QUV Accelerated Weathering	**Date:** 21 December 2023
Polyurea, Hybrid and Polyurethane	**Document Number:** TR-0002302-6M

introduction

This technical report assesses the colour change, gloss change, and DFT loss after 1000 hours of accelerated weathering to ASTM D154 Cycle 1. All the test panels within the series that have a topcoat of Polyurea, Hybrid and Polyurethane are below. Rather than using controls to evaluate one product, the mini-report evaluates the whole range of polyurea, hybrid and polyurethane products.

Results

Tabulated data for the series

System	QUV Hours	dL*(D65)	da*(D65)	db*(D65)	dE*ab(D65)	Visual Comment
Metalox P2 / Elaston W80 White (24 Hrs)	500 Hrs	-14.74	11.28	33.4	38.21	Darker, Redder, Yellower
	1000 Hrs	-15.16	11.63	30.77	36.22	
Tufflon-P80 White	500 Hrs	-12.97	9.51	31.69	35.54	Darker, Redder, Yellower
	1000 Hrs	-13.86	9.92	26.58	31.57	
Polytuff-21 White	500 Hrs	-19.13	16.23	25.47	35.75	Darker, Redder, Yellower
	1000 Hrs	-19.16	15.40	18.85	30.98	
Tufflon-P90 Mid Grey	500 Hrs	-3.71	0.00	19.89	20.23	Yellowing and slightly darker
	1000 Hrs	-3.49	0.36	18.42	18.75	
Hybron-H90 Yellow	500 Hrs	-7.00	5.39	-7.30	11.46	Darker and redder
	1000 Hrs	-8.29	6.06	-1.90	10.45	
Hybron-W90 Black	500 Hrs	-1.24	-0.09	1.12	1.67	Darker
	1000 Hrs	-7.03	-0.12	2.81	7.57	
Tufflon-D60 Black	500 Hrs	1.85	0.10	0.63	1.96	No colour change.
	1000 Hrs	0.52	0.10	0.54	0.75	

All the polyurea and polyurethane whites changed quickly to approximately an AS2700 Sandstone Y53 colour. The Polyurea Mid Grey changed to a yellow-green grey colour. Approximately the same as AS2700 G43 Avocado. The Hybrid Yellow shifts toward the same colour as AS2700 Sandstone Y53 colour. The polyurea and Hybrid Black did not change colour in an obvious way.

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All of the polyurea, hybrid and polyurethane membranes tested lost gloss to a very low level (matte) and no product suffered from significant DFT loss.

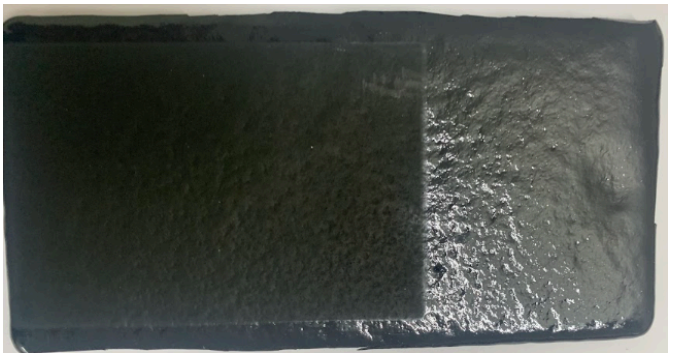
Metalox-P2 / Elaston-W80 White

Tufflon-P80 White

Polytuff-21 White

Tufflon-P90 Mid Grey

Hybron-H90 Yellow



Hybron-W90 Black

Tufflon-D60 Black

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Conclusion

The following conclusions are drawn from the above results.

- All aromatic polyurea, hybrid and polyurethane will change colour. The lighter the colour, the greater the yellowing. Yellow and black have significantly less colour change.
- All aromatic polyurea, hybrid and polyurethane will lose their gloss and chalk. The low gloss is consistent and looks good.
- The colour change for aromatic polyurea, hybrid and polyurethane occurs early after exposure to UV and then becomes more consistent after the initial colour change.
- None of the samples experienced high levels of DFT loss.

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