S4 Appendix. Model summary statistics for the change in yellowness index (YI) under the HotQUV and CyclicQUV exposures (Model 1)

Eq S4.1 is the fitted expression using R's *lm* function for fixed-effects modeling and Eq S4.2 is the model expression with parameter estimates. Table S4.1, Table S4.2, and Table S4.3 provide residuals of the fitted model, model summary statistics, and coefficients of the parameter estimates of the fitted model, respectively, for the change in yellowness index (YI) under the HotQUV and CyclicQUV exposures.

$$YI \sim (Step \times Material \times Exposure)$$
$$+ (I(Step^2) \times Material) + (I(Step^3) \times Material) \tag{S4.1}$$

Table S4.1. Residuals of the fitted model for the change in yellowness index (YI) under the HotQUV and CyclicQUV exposures.

Minimum	1st Quantile	Median	3rd Quantile	Maximum
-1.00930	-0.10170	-0.00189	0.09361	0.96893

Table S4.2. Model summary statistics for the change in yellowness index (YI) under the HotQUV and CyclicQUV exposures.

Residual standard error	0.2315 on 192 degrees of freedom
Multiple R^2	0.9877
Adjusted R^2	0.9866
Predictive R^2 (moving)	0.9709
Predictive R^2 (global)	0.9810
F-statistic	906.5 on 17 and 192 degrees of freedom
p-value	< 2.2e-16

Table S4.3. Coefficients of parameter estimates for the change in yellowness index (YI) under the HotQUV and CyclicQUV exposures.

		Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	β_0	1.356386	0.073730	18.397	< 2e-16	***
MaterialUnStab	β_{01}	-1.012225	0.104270	-9.708	< 2e-16	***
MaterialUVStab	β_{02}	-0.250507	0.104270	-2.402	0.017236	*
ExpHotQUV	β_{03}	0.201429	0.087501	2.302	0.022407	*
MaterialUnStab:ExpHotQUV	β_{04}	-0.254464	0.123745	-2.056	0.041101	*
MaterialUVStab:ExpHotQUV	β_{05}	-0.142500	0.123745	-1.152	0.250935	
Step	β_1	0.906163	0.091868	9.864	< 2e-16	***
Step:MaterialUnStab	β_{11}	0.114249	0.129920	0.879	0.380296	
Step:MaterialUVStab	β_{12}	-0.921249	0.129920	-7.091	2.49e-11	***
Step:ExpHotQUV	β_{13}	0.393333	0.028241	13.928	< 2e-16	***
Step:MaterialUnStab:ExpHotQUV	β_{14}	-0.267902	0.039939	-6.708	2.15e-10	***
Step:MaterialUVStab:ExpHotQUV	β_{15}	-0.222173	0.039939	-5.563	8.82e-08	***
I(Step^2)	β_2	-0.041100	0.035440	-1.160	0.247604	
MaterialUnStab:I(Step^2)	β_{21}	0.034350	0.050119	0.685	0.493940	
MaterialUVStab:I(Step^2)	β_{22}	0.179824	0.050119	3.588	0.000423	***
I(Step^3)	β_3	0.005682	0.003664	1.551	0.122560	
MaterialUnStab:I(Step^3)	β_{31}	-0.005953	0.005181	-1.149	0.252000	
MaterialUVStab:I(Step^3)	β_{32}	-0.015538	0.005181	-2.999	0.003068	**

Significance codes for the parameter estimates: 0 '***', 0.001 '**', 0.01 '*' 0.05 '.', 0.1 ' '

$$\begin{aligned}
YI \approx\ &(\mathbf{1.3563} - \mathbf{1.0122}M_1 - \mathbf{0.2505}M_2 + \mathbf{0.2014}X - \mathbf{0.2544}M_1X - 0.1425M_2X) \\
&+ (\mathbf{0.9061} + 0.1142M_1 - \mathbf{0.9212}M_2 + \mathbf{0.3933}X - \mathbf{0.2679}M_1X - \mathbf{0.2221}M_2X)t \\
&+ (-0.0411 + 0.0343M_1 + \mathbf{0.1798}M_2)t^2 \\
&+ (0.0056 - 0.0059M_1 - \mathbf{0.0155}M_2)t^3
\end{aligned}$$

$$(S4.2)$$