



ToxFMD®
Screened Chemistry
v. 3.0
Overview

March 2024

ToxServices' Screened Chemistry leverages the power of full materials disclosure, chemical analysis, robust chemical hazard assessment, and [ZDHC MRSL v.3.1](#) evaluation to identify safer formulations.

This document provides supplemental information to aid in the understanding of how a ToxFMD® Screened Chemistry Score is calculated.

Should you have any questions about interpretation of your Formulation's Screened Chemistry Score or if are interested in having your formulation reviewed under ToxServices' ToxFMD® Screened Chemistry Program, please contact the ToxFMD® Screened Chemistry Program Manager Kristi Gomella at kgomella@toxservices.com.

ToxFMD Screened Chemistry® Program

INTRODUCTION

ToxServices created Screened Chemistry in 2014 at the request of Levi Strauss & Co. ToxServices' ToxFMD Screened Chemistry® Standard (v. 3) is the result of a collaborative effort that aligns Levi Strauss & Co.'s Screened Chemistry Framework and Nike's Chemistry Prioritization Score. Aligning the two methods is intended to scale widespread implementation of safer chemical selection and informed substitution. Formulations used throughout the textile, apparel, and footwear production process can be screened using Screened Chemistry including textile auxiliaries, colorants, leather treatment chemicals, adhesives, and coatings. ToxFMD Screened Chemistry® incorporates hazard criteria and designations of several well-known hazard assessment frameworks, including U.S. EPA Safer Choice Program Criteria ([U.S. EPA 2021](#)), Clean Production Action's GreenScreen® for Safer Chemicals ([CPA 2018](#)), and ChemFORWARD Material Health Criteria ([ChemFORWARD 2023](#)).

SCREENED CHEMISTRY PROCESS

A Screened Chemistry assessment is valid for three years. As part of a Screened Chemistry assessment, all intentionally added chemicals and residuals above 100 ppm (0.01%) are assessed for human health and environmental toxicity and fate hazards using robust chemical hazard assessment methodologies such as the GreenScreen® for Safer Chemicals ([CPA 2018](#)) and ChemFORWARD ([ChemFORWARD 2023](#)). The formulation is chemically analyzed at an ISO 17025-accredited laboratory to provide additional assurance that the formulation complies with the current version of the ZDHC MRSL. In addition to the overall chemical hazard assessment, all assessed chemicals, with the exception of water, are assessed for skin sensitization potential.

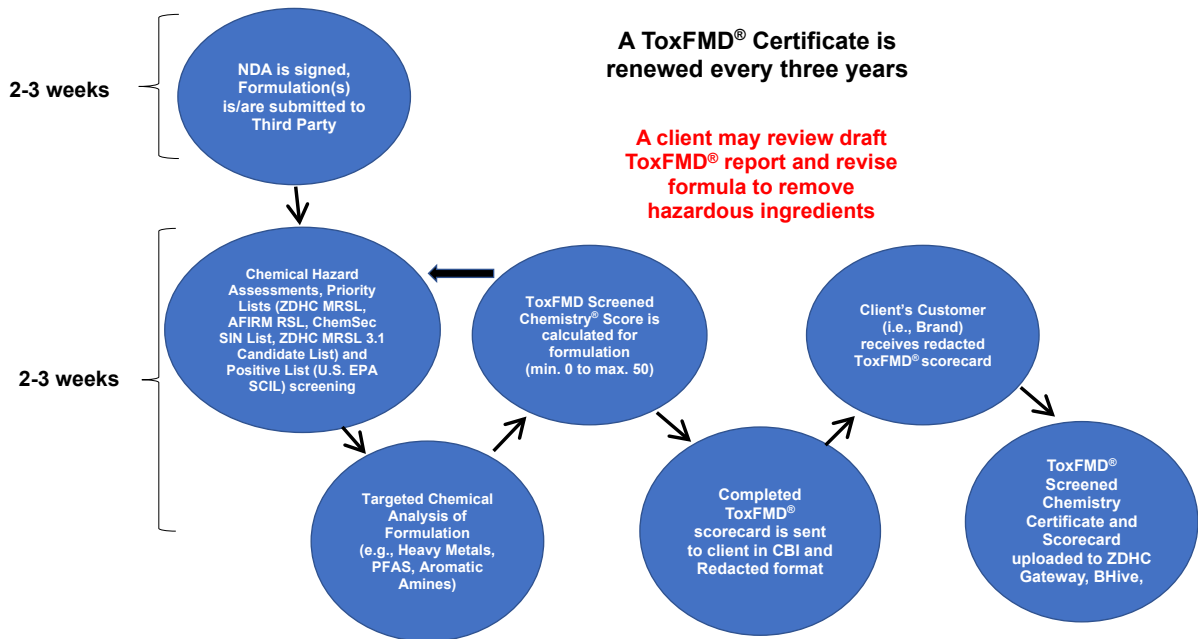


Figure 1: ToxFMD Screened Chemistry® Process

ToxFMD Screened Chemistry® Process

Figure 2 summarizes the Screened Chemistry process, comprising disclosure, assessment and analysis, and ingredient and formulation-level scoring. As shown in Figure 3, the output of a Screened Chemistry assessment is a formulation-level score that ranges from zero to 50. A formula that receives a Screened Chemistry score of 20 or above and is determined to meet the ZDHC MRSL (v.3.1) receives a ToxFMD® Screened Chemistry Scorecard and Certificate.



ToxServices' Full Materials Disclosure Screened Chemistry Program® (ToxFMD®) is used by leading Brands to identify a formulation's Screened Chemistry Score and ZDHC MRSL compliance in three easy steps:

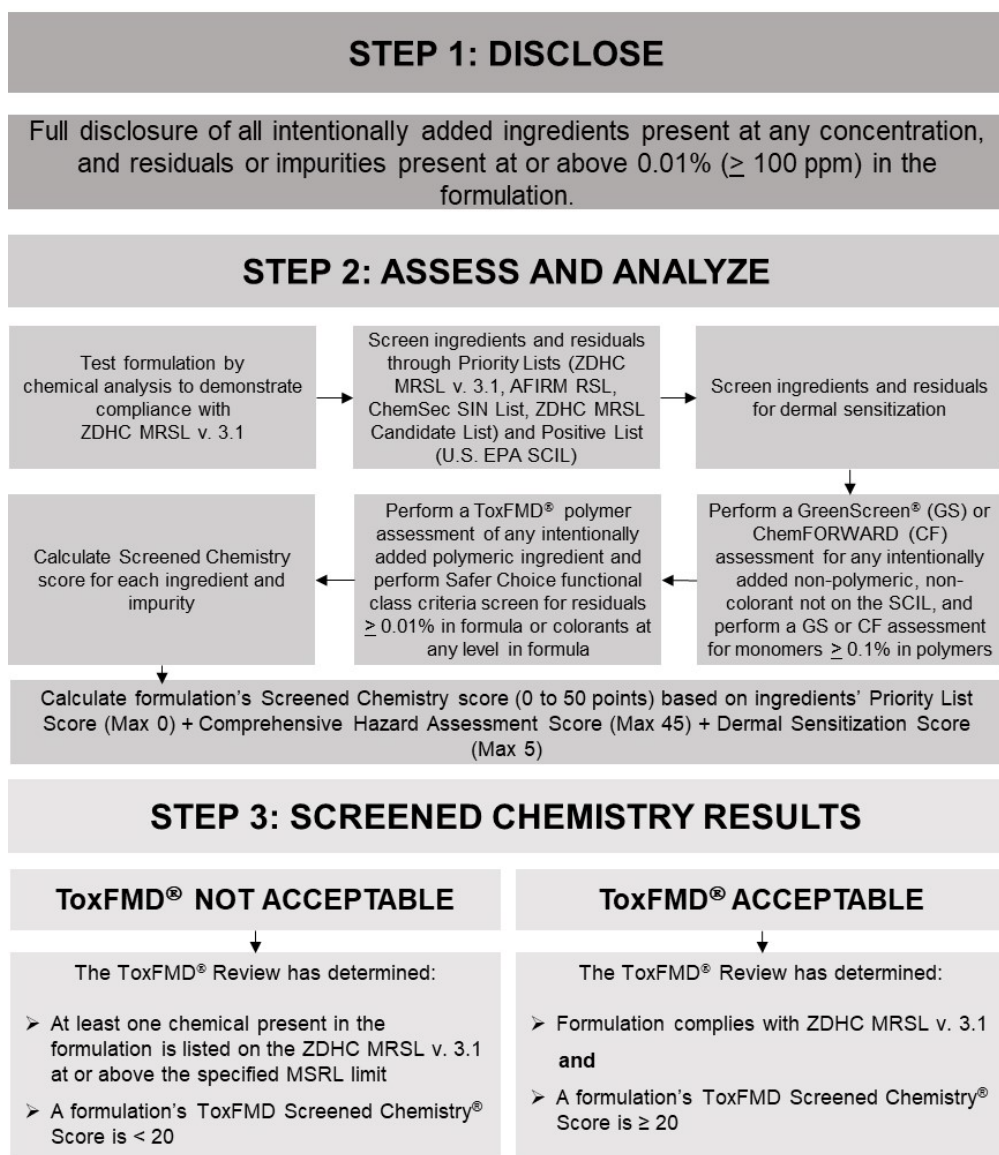


FIGURE 2: TOXFMD® SCREENED CHEMISTRY OVERVIEW

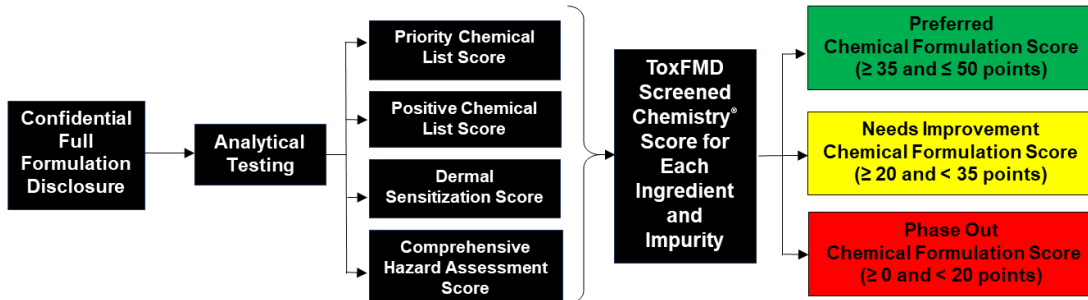


FIGURE 3: TOXFMD® SCREENED CHEMISTRY SCORING PROCESS

ToxFMD® SCREENED CHEMISTRY CERTIFICATE AND SCORECARD

If an assessed formulation is found to be “ToxFMD® Acceptable,” the client will receive a ToxFMD® Certificate and Scorecard for the formulation, and the brand receives a redacted Scorecard. If a formulation is found to be “ToxFMD® Not Acceptable,” the formulation will not receive a ToxFMD® Certificate. Examples of the Certificate and Scorecard are shown in Figures 4 and 5.

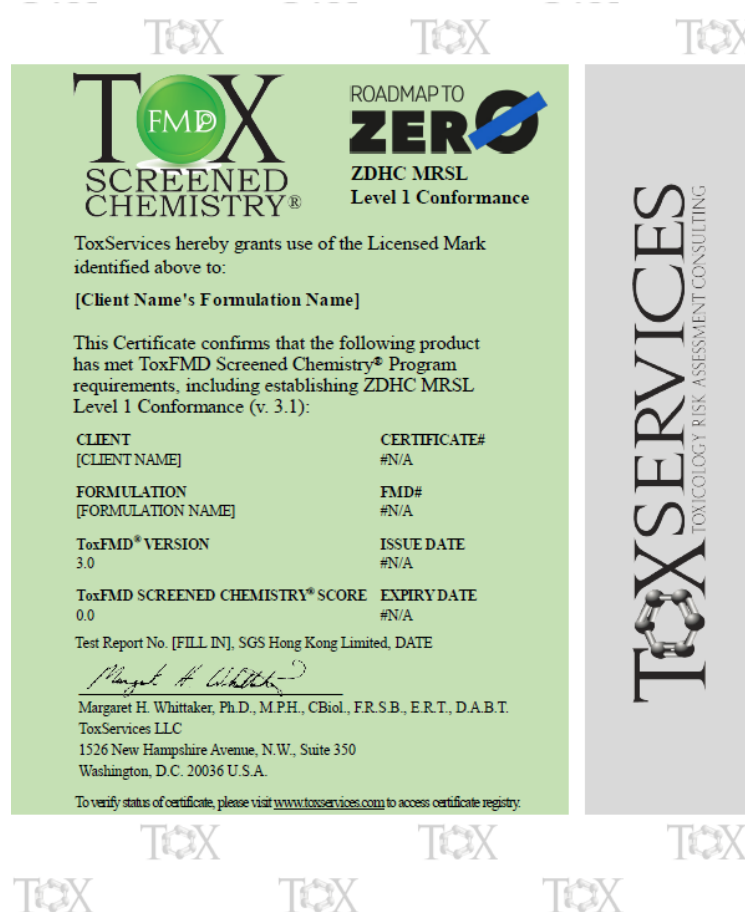



FIGURE 4: TOXFMD® SCREENED CHEMISTRY CERTIFICATE


TOX FMD SCREENED CHEMISTRY®
 ROADMAP TO **ZERO**
 ZDHC MRSL
 Level 1 Conformance

DATE
 #N/A
CLIENT
 [CLIENT NAME]
FORMULATION
 [FORMULATION NAME]
FMD#
 [#]
ToxFMD® VERSION
 3.0
APPLICATION
 [FORMULATION NAME] is a
 [PRODUCT DESCRIPTION].

**Hazard Classification of
 [Formulation Name] Ingredients**

- SCIL Full Green Circle (XXX%)
- GreenScreen Benchmark 4 (XXX%)
- ToxFMD Acceptable (XXX%)
- SCIL Half Circle Green (XXX%)
- SCIL Yellow Triangle (XXX%)
- GreenScreen Benchmark 3 (XXX%)
- GreenScreen Benchmark 2 (XXX%)
- ToxFMD Not Acceptable- Low Priority (XXX%)
- ToxFMD Not Acceptable- High Priority (XXX%)
- GreenScreen Benchmark 1/ELT-1 (XXX%)
- GreenScreen Benchmark U (XXX%)
- Cannot Be Assessed (XXX%)

Table 1: ToxFMD Screened Chemistry® Score

Category	Score
Priority List 1 Screening (ZDHC MRSL v. 3.1) AND Priority List 2 Screening (AFIRM RSL; SIN List, ZDHC MRSL Candidate List)	0.00
Positive Chemical List Score (U.S. EPA SCIL) OR Comprehensive Hazard Assessment (GreenScreen®, ChemFORWARD, and ToxFMD® Polymer Screen)	0.00
Dermal Sensitization	4.30
Final Screened Chemistry Score	0.00
Phase Out Needs Improvement Preferred ≥ 0 and < 20 points ≥ 20 and < 35 points ≥ 35 and ≤ 50 points	

Table 2: Restricted Substances List (RSL) Check*

Screened Chemistry Brand	Are chemicals present on RSL?*
AFIRM RSL	[Yes/No]
H&MRSL	[Yes/No]
Levi's RSL	[Yes/No]
Nike RSL	[Yes/No]
*RSLs are searched using CAS # and chemical names	

Table 3: ToxFMD Screened Chemistry® Criteria Summary**

Number of chemicals above ZDHC MRSL v. 3.1 Limits based on analytical testing/document review	0
Screened Chemistry Score ≥ 20	[Yes/No]
ToxFMD® certificate earned?	[Yes/No]
Documentation required at time of renewal? (Refer to ToxServices' action items summary report)	[Yes/No]
**To verify status of certificate and for details about ToxFMD Screened Chemistry® criteria, please visit https://toxservices.com/services/toxfmd	

FIGURE 5: TOXFMD® SCREENED CHEMISTRY SCORECARD (PAGE 1)

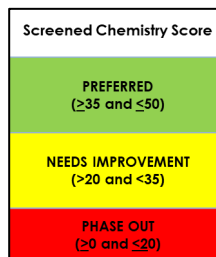
Chemical Name	CAS #	Functional Use	% in Formulation	Group I Human Health					Group II and II* Human Health							Ecotox.		Fate		Physical		GreenScreen® Benchmark Score/ EPA SCP Screen Results/ ToxFMD® Classification		
				Carcinogenicity	Mutagenicity	Reproductive	Developmental	Endocrine Activity	Acute Toxicity	Systemic Toxicity	Neurotoxicity	Skin Sensitization*	Respiratory Sensitization*	Skin Irritation	Eye Irritation	Acute Aquatic	Chronic Aquatic	Persistence	Bioaccumulation	Reactivity	Flammability			
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	L	L	M	L	DG	vH	vH	M	L	DG	L	M	vH	vH	vH	vH	vL	L	L	L	BM 2
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	-	-	-	-	-	#	-	#	-	-	-	#	#	-	-	-	-	#	#	SCIL Full Green Circle	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	-	#	-	-	-	#	-	#	-	#	#	#	#	-	-	-	-	#	#	ToxFMD® Acceptable	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	#	#	#	#	#	#	#	#	#	#	#	#	#	-	-	-	-	#	#	SCIL Full Green Circle	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	#	#	#	#	#	#	#	#	#	#	#	#	#	-	-	-	-	#	#	SCIL Full Green Circle	

FIGURE 5: TOXFMD® SCREENED CHEMISTRY SCORECARD (PAGE 2)

SCREENED CHEMISTRY PREFERRED CHEMICAL FORMULATIONS LIST

The Screened Chemistry PCL (“Preferred Chemicals List”) indexes Screened Chemistry scores for screened formulations. The PCL is publicly accessible through ADEC’s [CleanChain](#) database. The PCL can be searched by 38 functional classes, supplier name, trade name, and Screened Chemistry score (Preferred, Needs Improvement, and Phase Out). The PCL Score facilitates easy identification of safer formulations and is a central repository of all Screened Chemistry assessments.

ID#	SUPPLIER	GMT FUNCTION	MILL FUNCTION	CHEMICAL	DATE ADDED	CHARACTERISTICS	LS&CO HAZARD SCORE	RANKING	1e. DATED REVIEWED	1e. DATE EXPIRES (N)
XX	XXX	WETTING AGENT	LUBRICANT	Wetting Agent Example	DATE	Lubricant or softening agent for yarn or fabric	35.1	PREFERRED	08/08/2017	08/17/2022
XX	XXX	SOFTENER	n/a	Jean Softener Example	DATE	Anti-ozone modified fatty acid amide softener	27.9	NEEDS IMPROVEMENT	05/18/2017	05/22/2022
XX	XX	FIXING AGENT	n/a	Fixing Agent Example	DATE	Poly-amine fixing agent for garment dyeing	16.8	PHASE OUT	04/25/2017	04/25/2022



SCREENED CHEMISTRY SCORES

The summed Screened Chemistry score for individually scored chemicals (ingredients or residuals) is calculated as shown below:

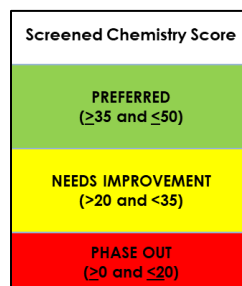
Priority Chemical List Score (Max 0 points) + Chemical Hazard Assessment Score (Max 45 points)
+ Dermal Sensitization Score (Max 5 points)

A formulation's Screened Chemistry score is the weighted average sum of the individual chemical scores for a formulation's ingredients and residuals. Appendix A provides two example formulations that have Screened Chemistry scores identifying a preferable formulation (Screened Chemistry Score of 36.6) and a phase out formulation (Screened Chemistry Score of 4.52).

APPENDIX A: EXAMPLE SCREENED CHEMISTRY SCORES

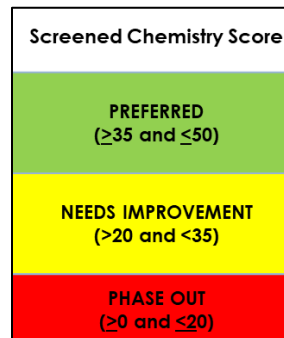
SCREENED CHEMISTRY EXAMPLE 1: FORMULATION A

Chemical and Formulation Scoring of Formulation A									
			Priority Chemical List		Hazard Classification		Skin Sensitization		
Chemical Name	Functional Class	Composition	Priority Chemical List Classification (Score)	Weighted Priority Chemical List Score	ToxFMD® Chemical Hazard Classification (Score)	Weighted ToxFMD® Chemical Hazard Score	Skin Sensitization Classification (Score)	Weighted Skin Sensitization Chemical Score	Total Weighted Screened Chemistry Chemical Score
Ingredient 1	Solvent	62%	Not on Priority 1 or 2 Chemical Lists (0)	0	U.S. EPA SCIL Full Green Circle (30)	18.60	Low Skin Sensitization (5)	3.10	21.70
Ingredient 2	Surfactant	1%	Not on Priority 1 or 2 Chemical Lists (0)	0	U.S. EPA Half Green Circle (25)	0.25	Low Skin Sensitization (5)	0.050	0.25
Ingredient 3	Processing Aid	1.8%	Not on Priority 1 or 2 Chemical Lists (0)	0	GreenScreen® Benchmark 3 (35)	0.63	Low Skin Sensitization (5)	0.090	0.72
Polymer 4	Polymer	35.1%	Not on Priority 1 or 2 Chemical List (0)	0	ToxFMD® Acceptable (35)	12.28	Low Skin Sensitization (5)	1.75	14.03
Impurity 5	Impurity	0.1%	Not on Priority 1 or 2 Chemical Lists (0)	0	ToxFMD® Not Acceptable – Low Priority (25)	0.023	Moderate Skin Sensitization (0)	0	0.023
Weighted Scores				0		31.78		4.99	36.7
Total CHA Screened Chemistry Formulation Score (Preferred)									



Category	Score
Priority List 1 Screening (ZDHC MRSL v. 3.1) AND Priority List 2 Screening (AFIRM RSL; SIN List; ZDHC MRSL Candidate List)	0
Positive Chemical List Score (U.S. EPA SCIL) OR Comprehensive Hazard Assessment (GreenScreen®, ChemFORWARD, and ToxFMD® Polymer/Residual/Colorant Screen)	31.78
Dermal Sensitization	4.99
Final Screened Chemistry Score	36.7

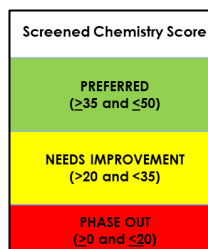
Conclusion: Formulation A receives a ToxFMD® Certificate, is ZDHC MRSL v 3.1 compliant, and is considered a “Preferred Finished Formulation” because its Screened Chemistry score is ≥ 35 .



SCREENED CHEMISTRY EXAMPLE 2: FORMULATION B

Chemical and Formulation Scoring: Formulation B									
			Priority Chemical List		Hazard Classification		Skin Sensitization		
Chemical Name	Functional Class	Composition	Priority Chemical List Classification (Score)	Weighted Priority Chemical List Score	ToxFMD [®] Chemical Hazard Classification (Score)	Weighted ToxFMD [®] Chemical Hazard Score	Skin Sensitization Classification (Score)	Weighted Skin Sensitization Chemical Score	Total Weighted Screened Chemistry Chemical Score
Ingredient 1	Solvent	61%	Not on Priority 1 or 2 Chemical Lists (0)	0	U.S. EPA SCIL Yellow Triangle (20)	12.20	Low Skin Sensitization (5)	3.05	15.25
Ingredient 2	Processing Aid	19.6%	Not on Priority 1 or 2 Chemical Lists (0)	0	GreenScreen [®] Benchmark U (0)	0	Low Skin Sensitization (5)	0.98	0.98
Polymer 3	Polymer	10.1%	Not on Priority 1 or 2 Chemical Lists (0)	0	ToxFMD [®] Acceptable (35)	3.53	Low Skin Sensitization (5)	0.50	4.03
Polymer 4	Polymer	9.1%	Not on Priority 1 or 2 Chemical Lists (0)	0	ToxFMD [®] Not Acceptable – Low Priority (25)	2.27	Low Skin Sensitization (5)	0.45	2.72
Impurity 5	Impurity	0.11%	Not on Priority 1 or 2 Chemical Lists (0)	0	ToxFMD [®] Not Acceptable – High Priority (Cap 0, formula level) ¹	N/A (Cap 0)	Low Skin Sensitization (5)	0.0055	N/A (Cap 0)
Impurity 6	Impurity	0.09%	Not on Priority 1 or 2 Chemical Lists (0)	0	ToxFMD [®] Not Acceptable – Low Priority (25)	0.022	High Skin Sensitization (-10)	-0.0090	0.013
Weighted Scores			0		N/A (Cap 0)			4.97	Cap 0¹
Total CHA Screened Chemistry Formulation Score (Phase Out)									

¹ If formulation includes one or more Ingredients or residuals with a ToxFMD[®] Not Acceptable – High Priority or GreenScreen[®] Benchmark 1 classification, the formulation score is capped at 0 (Cap 0).



Category	Score
Priority List 1 Screening (ZDHC MRSL v. 3.1) AND Priority List 2 Screening (AFIRM RSL; SIN List; ZDHC MRSL Candidate List)	0
Positive Chemical List Score (U.S. EPA SCIL) OR Comprehensive Hazard Assessment (GreenScreen®, ChemFORWARD, and ToxFMD® Polymer/Residual/Colorant Screen)	Cap 0
Dermal Sensitization	4.97
Final Screened Chemistry Score	0

Conclusion: Formulation B does not receive a ToxFMD® Certificate and is considered a “Phase Out” formulation because its Screened Chemistry score is less than 20 due to the presence of a failing impurity.

