

Locus Performance Ingredients

Performance-Driven, Sustainable Solutions

The future of sustainable, high-performing ingredients for product formulations

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Locus Performance Ingredients

An operating company of **Locus Fermentation Solutions**



Locus Fermentation Solutions, an Ohio-based, globally recognized biosurfactant company and award-winning green tech organization accelerating sustainable solutions across multiple biotech platforms and industries.

Locus Fermentation Solutions



Locus Bio-Energy Solutions



Locus Animal Nutrition



Locus Agricultural Solutions



Locus Wellness Solutions

Locus Performance Ingredients



Dow Signs Exclusive Agreement with Locus PI

This Exclusive Agreement Expands Dow's Biosurfactant Offerings in the Global Home Care and Personal Care Markets

"This exclusive partnership with Dow enables accelerated global adoption of high-performance ingredients that address numerous industry challenges while advancing shared sustainability goals. The resulting products formulated with biosurfactants can offer greater effectiveness while being gentler on both people and the planet."



Tim Staub, CEO of Locus Performance Ingredients



Farooq Alam, Global Strategic Marketing Manager for Dow Home Care

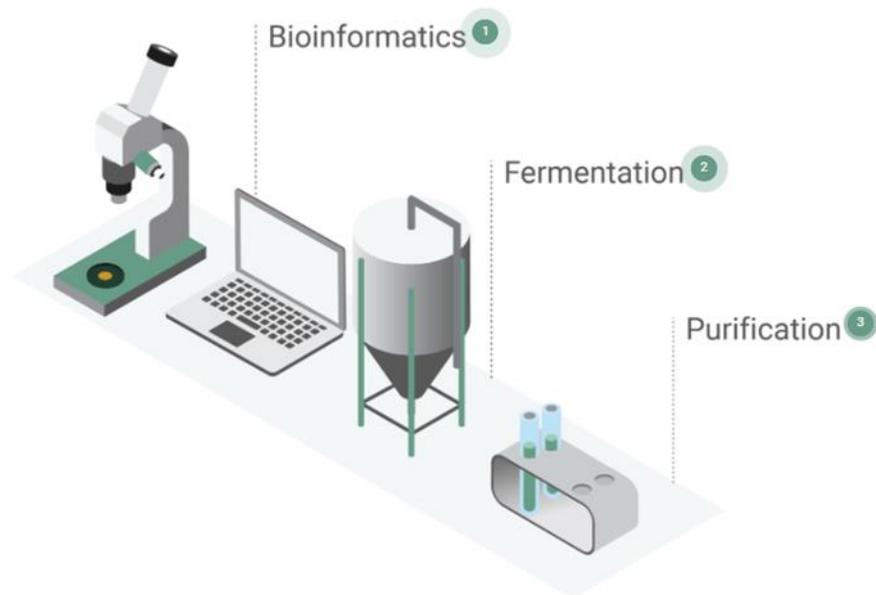
"This partnership with Locus PI, an unrivaled expert in biosurfactants and fermentation, complements our innovation, strength and strong position in home care and personal care. The addition of Locus PI's biodegradable and sustainable ingredients allows us to further deliver on our promise to accelerate the transition towards a low-carbon, circular economy."



Innovation company developing high performance, sustainable products for formulation chemistry markets

Locus Performance Ingredients

Patented bioinformatics and fermentation technology to deliver microbial-based solutions that provide sustainability and performance to improve product formulations in Personal Care, Home Care and Industrial applications



Technology overview:

- ✓ 39 patent applications - 1 issued - 19 trade secrets
- ✓ Core technology spans bioinformatics, process technology, microbes, applications, and derivative molecules
- ✓ Focused on unique, bio-based, high-performance ingredients with sustainable competitive advantage
- ✓ Collaborating with major global brands, indies, & partners

Biosurfactants - Sophorolipids

**Concept to commercial –
in 12 months**

Biosurfactants: Performance, Safety & Sustainability

Consumer Demand for Safer, Greener Products¹

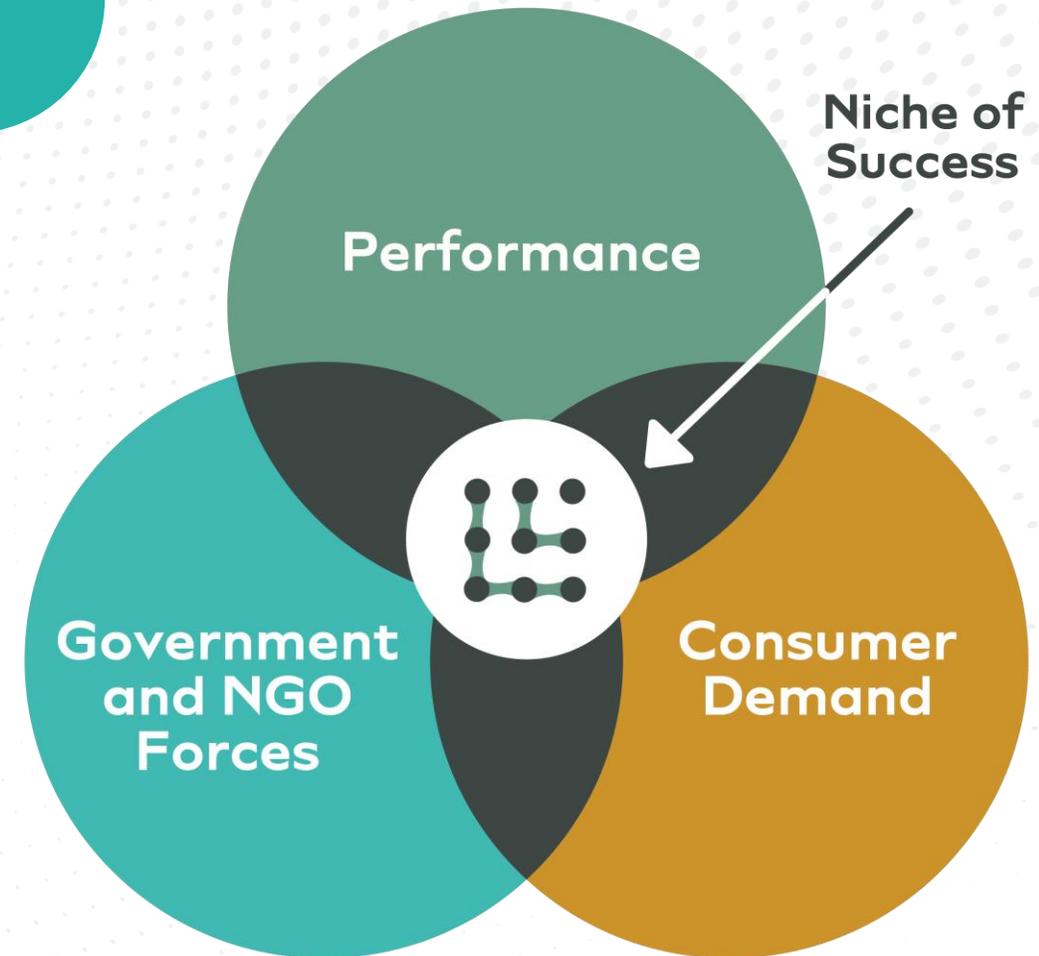
- 79% of consumers change their purchase preferences based on sustainability, safety or other environmental factors
- 66% purchase products based on 'environmental friendliness'
- 42% of consumers actively search labels for safer or more sustainable ingredients

Societal Forces for Change

- Eliminate toxic Prop 65 residual chemicals
- Simplify labeling (natural ingredients)
- Meet the needs of major channels (Walmart, Target, etc.)
- Dramatically improve carbon footprint
- Non-GMO, biodegradable, 100% natural, certifications
- Palm-free – impacts deforestation; human rights/labor issues

Performance – Do Well and Do Good

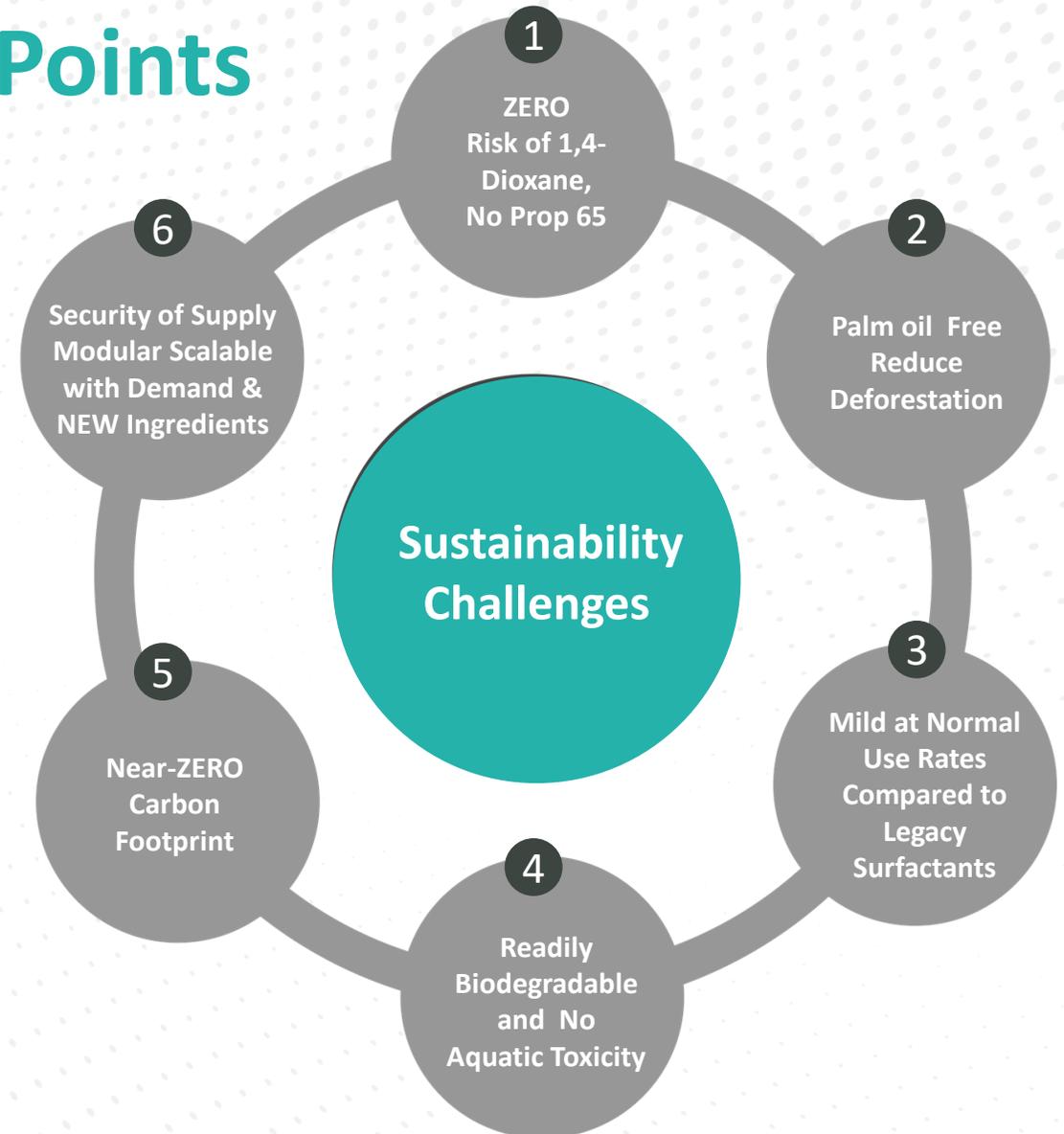
- Outperforms traditional legacy chemicals
- Replaces a broad range of functionalized ingredients
- Cost-in-use makes price and profit strong for makers and users
- Monetizing the carbon footprint



¹ CapGemini Research Institute: Consumer Products and Retail – How sustainability is fundamentally changing consumer preferences – July 2020

Biosurfactants: Providing Solutions to Six Critical Industry Pain Points

- 1 Biosurfactants are 100% free of 1,4-dioxane and other harmful trace chemicals – **banned in NY State and restricted in CA, OR**
- 2 Biosurfactants are 100% free of palm oil and provide raw material diversification opportunities
- 3 Biosurfactants are mild and can reduce the damage caused by petrochemical-derived and sulfate surfactants
- 4 Biosurfactants rapidly biodegrade— categorized as Readily Biodegradable: 61% in 8 days
- 5 Our biosurfactants provide a near-ZERO carbon footprint
- 6 Our novel fermentation platform allows rapid scale-up at low capital cost—in 12 months or less—anywhere in the world



Performance-Driven, Sustainable Solutions

Locus PI has launched a line of non-GMO sophorolipid ingredients that outperform and replace problematic chemical surfactants in a variety of CPG product formulas

- **Multifunctional**
 - Can replace two or more legacy surfactants
 - Low use levels yielding low cost-in-use
- **Near-Zero Carbon Footprint**
- **Sustainable**
 - USDA certified 100% bio-based
 - non-GMO
 - Readily biodegrade
 - Non-toxic
 - Non-hazardous for transport & packaging



ferma SH ferma SL

amph

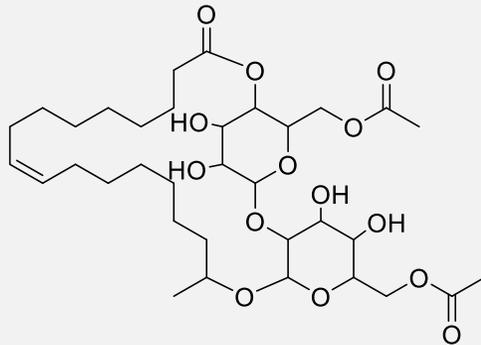


Biosurfactants – Sophorolipids

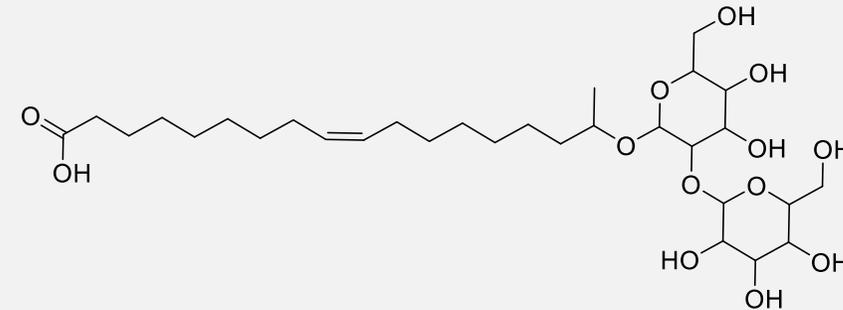
INCI Name: Glycolipids

CAS # 1573124-58-9

Lactonic Molecule



Linear Molecule



Versatile HLB properties for any Application

Performance

ferma® SH

- Oil/water emulsifier
- Detergency and foam

Hydrophilic

- High Foaming agents
- Solubilizing agents

Water dispersible blends

- Detergents
- Emulsion agents (oil/water)
- Wetting and spreading agents

Hydrophobic

ferma® SL

- Water/oil emulsifier
- No/low foam

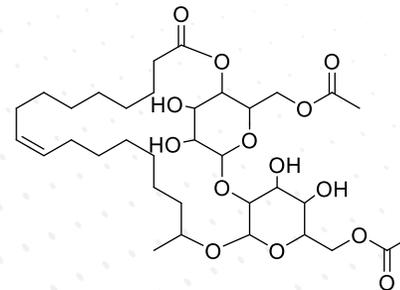
amphi™ M

- TSCA-approved
- H, I & I applications

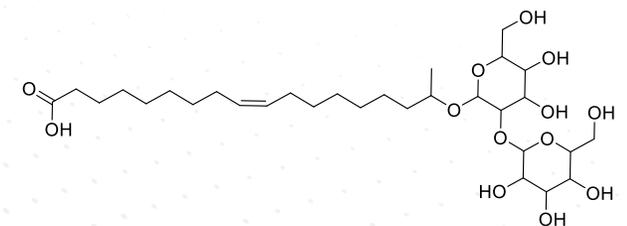
- Emulsion agents (water/oil)
- Grease cutting agents
- Antifoaming

Benefits

- Lower CMC (critical micelle concentration)
- Better surface tension reduction
- Surface active agent and emulsifier
- Higher grease removal efficacy
- Mild and reduces damage caused by legacy surfactants
- Very low aquatic toxicity
- Higher efficacy / lower dosage
- Competitive cost-in-use
- Safer – biodegradable, non-toxic
- Active at broad pH ranges (2 – 10)



Lactonic Molecule



Linear Molecule

Performance Starts with Quality



60% Active Sophorolipids

- Highest in the industry
- Less than 5% residual fatty acids



Color

- Allows for clear formulation up to 6-8%
- pH will clear higher loading



Clarity

- No volatile solvents used
- Filtered



Odor

- Low odor – has been used in face washes



Product Integrity

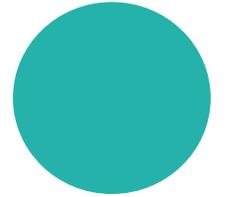
- Pasteurized
- Natural stabilizer
- Hot filled

Formulary and Claims Data

Dr. Lee Speight

Formulary Goals and Targets

- Set performance criteria based on market leading consumer brand
- Holistically formulate with sophorolipids
- Fill in performance gaps with synergistic co-surfactants
- Validate achievement of performance targets
- Designed to be directionally useful
- Allow for brands to optimize



Stain

Water

Benchmark
Formulation

Amphi™
Formulation

All Purpose Cleaner

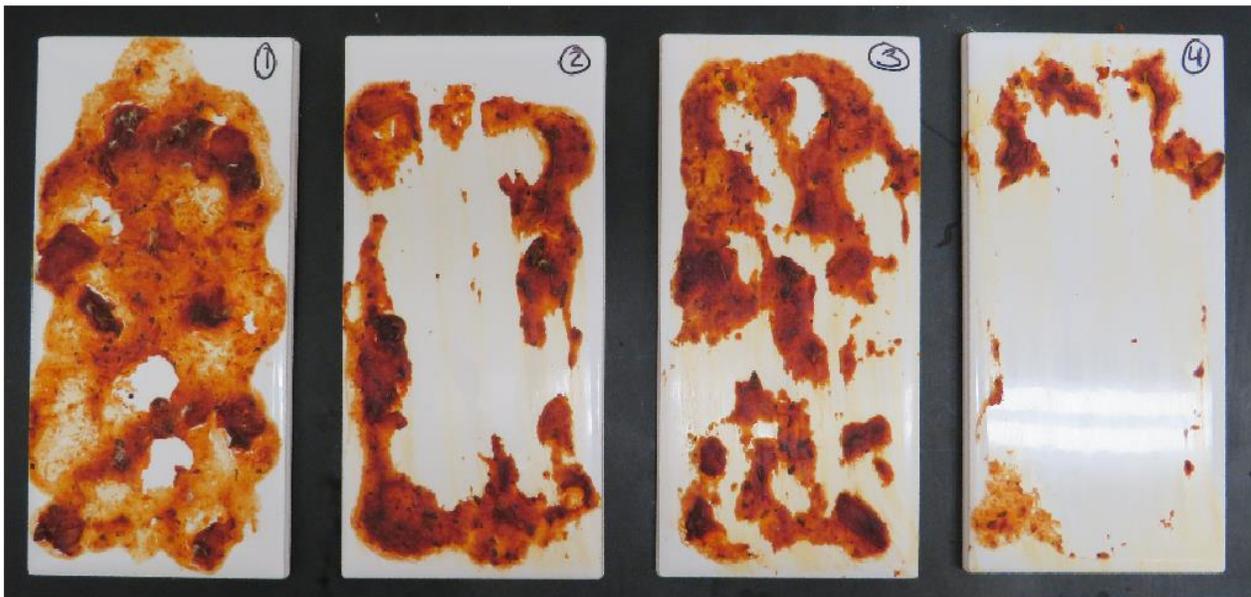
%	Ingredient
94.32	Water
3.55	Amphi™ M
0.66	Sodium Citrate
0.86	Preservative
0.10	Sodium Hydroxide
0.23	Urea
0.23	Fragrance
0.03	Iminodisuccinate
100.00	Total

Procedure	
Step	Actions
1	Apply stain
2	1x Spray Cleaner
3	Wipe 2x

Tomato
Sauce
Stain



1x Spray
2x wipe



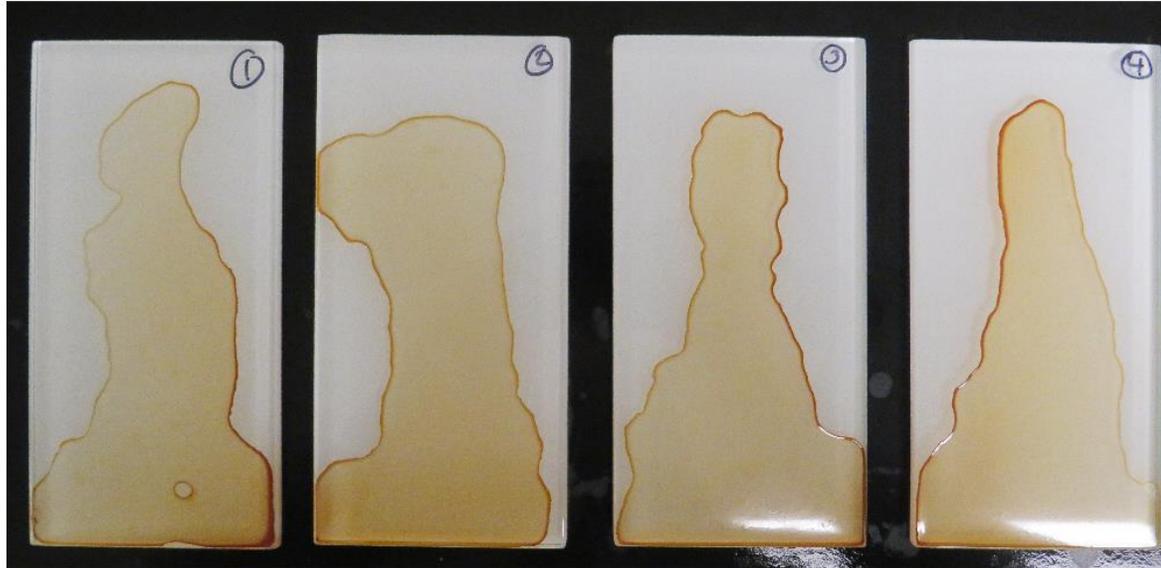
Coffee Stain

Stain

Water

Benchmark
Formulation

Amphi™
Formulation



1x Spray
2x wipe



All Purpose Cleaner

%	Ingredient
94.32	Water
3.55	Amphi™ M
0.66	Sodium Citrate
0.86	Preservative
0.10	Sodium Hydroxide
0.23	Urea
0.23	Fragrance
0.03	Iminodisuccinate
100.00	Total

Procedure

Step	Actions
1	Apply stain
2	1x Spray Cleaner
3	Wipe 2x

Amphi™ M Formulation



Benchmark Formulation



Simulated
Blood
Stain

After
Treatment

Procedure	
Step	Actions
1	Apply stain
2	Cover stain with carpet cleaner product
3	Scrub with brush 10x
4	Run over with carpet cleaner (downward) 2x

Carpet Shampoo

%	Ingredient
77.19	Water
7.28	Amphi™ M
0.56	Sodium Citrate
0.19	Acrylic Polymer
5.56	Sodium Caprylyl Sulfonate
0.42	Disodium Phosphate
0.56	Fragrance
0.09	Preservative
0.37	Sodium Hydroxide
0.83	Zinador™ 35
0.46	Chelator
4.64	Isopropyl Alcohol
1.85	Sodium Lauroyl Sarcosinate
100.00	Total

Amphi™ M Formulation

Benchmark Formulation

Tomato Sauce Stain



After Treatment



Procedure	
Step	Actions
1	Apply stain
2	Cover stain with carpet cleaner product
3	Scrub with brush 10x
4	Run over with carpet cleaner (downward) 2x

Carpet Shampoo

%	Ingredient
77.19	Water
7.28	Amphi™ M
0.56	Sodium Citrate
0.19	Acrylic Polymer
5.56	Sodium Caprylyl Sulfonate
0.42	Disodium Phosphate
0.56	Fragrance
0.09	Preservative
0.37	Sodium Hydroxide
0.83	Zinador™ 35
0.46	Chelator
4.64	Isopropyl Alcohol
1.85	Sodium Lauroyl Sarcosinate
100.00	Total

Amphi™ M Formulation

Benchmark Formulation



**Waterproof
Mascara
Stain**

**After
Treatment**

Procedure	
Step	Actions
1	Apply stain
2	Cover stain with carpet cleaner product
3	Scrub with brush 10x
4	Run over with carpet cleaner (downward) 2x

Carpet Shampoo

%	Ingredient
77.19	Water
7.28	Amphi™ M
0.56	Sodium Citrate
0.19	Acrylic Polymer
5.56	Sodium Caprylyl Sulfonate
0.42	Disodium Phosphate
0.56	Fragrance
0.09	Preservative
0.37	Sodium Hydroxide
0.83	Zinador™ 35
0.46	Chelator
4.64	Isopropyl Alcohol
1.85	Sodium Lauroyl Sarcosinate
100.00	Total

Amphi™ M Formulation

Benchmark Formulation

Juice Stain



After Treatment



Procedure	
Step	Actions
1	Apply stain
2	Cover stain with carpet cleaner product
3	Scrub with brush 10x
4	Run over with carpet cleaner (downward) 2x

Carpet Shampoo

%	Ingredient
77.19	Water
7.28	Amphi™ M
0.56	Sodium Citrate
0.19	Acrylic Polymer
5.56	Sodium Caprylyl Sulfonate
0.42	Disodium Phosphate
0.56	Fragrance
0.09	Preservative
0.37	Sodium Hydroxide
0.83	Zinador™ 35
0.46	Chelator
4.64	Isopropyl Alcohol
1.85	Sodium Lauroyl Sarcosinate
100.00	Total

Amphi™ M Formulation

Benchmark Formulation

Coffee Stain



After Treatment



Procedure	
Step	Actions
1	Apply stain
2	Cover stain with carpet cleaner product
3	Scrub with brush 10x
4	Run over with carpet cleaner (downward) 2x

Carpet Shampoo

%	Ingredient
77.19	Water
7.28	Amphi™ M
0.56	Sodium Citrate
0.19	Acrylic Polymer
5.56	Sodium Caprylyl Sulfonate
0.42	Disodium Phosphate
0.56	Fragrance
0.09	Preservative
0.37	Sodium Hydroxide
0.83	Zinador™ 35
0.46	Chelator
4.64	Isopropyl Alcohol
1.85	Sodium Lauroyl Sarcosinate
100.00	Total

More Home Care Cleaning Formulations to Come



Glass Cleaner

Car Wash

Bathroom Tub & Tile

Stainless Steel

Degreaser



Sulfate-Free Hand Soaps



**Foaming Hand Cleanser:
10x Concentrate**

%	Ingredient
38.20	Water
16.94	Ferma® SL
11.25	Ferma® SH
0.02	EDTA
0.12	Citric Acid
17.60	Glycerin
13.67	Sodium Methyl Cocoyl Taurate
1.20	Fragrance
1.00	Lincoserve® SSB
100.00	Total

**Foaming Hand Cleanser:
In-Use Foaming Dispenser**

%	Ingredient
93.82	Water
1.694	Ferma® SL
1.125	Ferma® SH
0.002	EDTA
0.012	Citric Acid
1.76	Glycerin
1.367	Sodium Methyl Cocoyl Taurate
0.12	Fragrance
0.10	Lincoserve® SSB
100.00	Total

**Foaming Hand Cleanser:
Ready-to-Use Gel**

%	Ingredient
89.93	Water
2.71	Ferma® SL
1.80	Ferma® SH
0.003	EDTA
0.002	Citric Acid
2.816	Glycerin
2.187	Sodium Methyl Cocoyl Taurate
0.192	Fragrance
0.16	Lincoserve® SSB
0.20	Xanthan Gum
100.00	Total



Sulfate-, Salt-, & Citric Acid-Free Body Wash

Moisturizing Body Wash	
%	Ingredient
69.23	Water
1.35	Acrylates/C10-30 Alkyl Acrylate Crosspolymer
0.25	Hydroxyethyl Cellulose
7.40	Ferma® SH
6.25	Ferma® SL
5.12	Sodium Lauroyl Sarcosinate
6.90	Petrolatum
0.15	Glyceryl Oleate
0.50	Mineral Oil
1.00	Soybean Oil
1.00	Shea Butter
0.05	Preservative
0.80	Fragrance
100.00	Total

Micellar Water

Micellar Water Cleanser & Makeup Remover	
%	Ingredient
Phase A	
65.00	Water
9.00	Brontide® Natural Butylene Glycol
4.00	Ferma® SL
7.00	Ferma® SH
1.00	Lincoserve® SSB
Phase B	
6.00	LexFeel® N200 MB
8.00	LexFeel® WOW
100.00	Total



Ferma® S Biosurfactants



By Locus Performance Ingredients



Brontide® Natural Butylene Glycol



By Genomatica



Clear Shampoo with Ferma® SL	
%	Ingredient
84.27	Water
0.90	Natrosol™ 250 HHR
0.03	Sodium Hydroxide Lye
4.00	Pureact WS Conc.
9.50	Ferma® SL
0.15	Dermofeel® PA-12
1.15	Lincoserve® SSB
100.00	Total

Clear Shampoo with Ferma® SH*	
%	Ingredient
45.00	Water
30.00	Colonial AOS-40
15.00	Ferma® SH
4.00	Promidium™ CO
1.00	Sensiva® PA 30
5.00	Versathix™
100.00	Total

2-in-1 Shampoo/Conditioner	
%	Ingredient
72.95	Water
1.23	Natrosol™ 250 HHR
0.45	DL-Panthenol
1.44	Honey Extract in GL
1.82	Dehyquart® A-CA
1.30	Aloe Juice 1X Decolorized
9.27	Ferma® SH
4.73	Ferma® SL
0.73	Glycol Distearate
3.18	Glycol Stearate
1.22	Ceraphyl™ 70
0.93	Sensiva® PA 40
0.75	Fragrance
100.00	Total

*Formulated by ACT Solutions,
Newark, DE Office: 1-302-525-8110;
Email: info@actsolutionscorp.com

More Personal Care Formulations to Come



Facial Cleanser

Facial Cleanser with Salicylic
Acid

Moisturizing Body Lotion





Performance-Driven, Sustainable Solutions

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