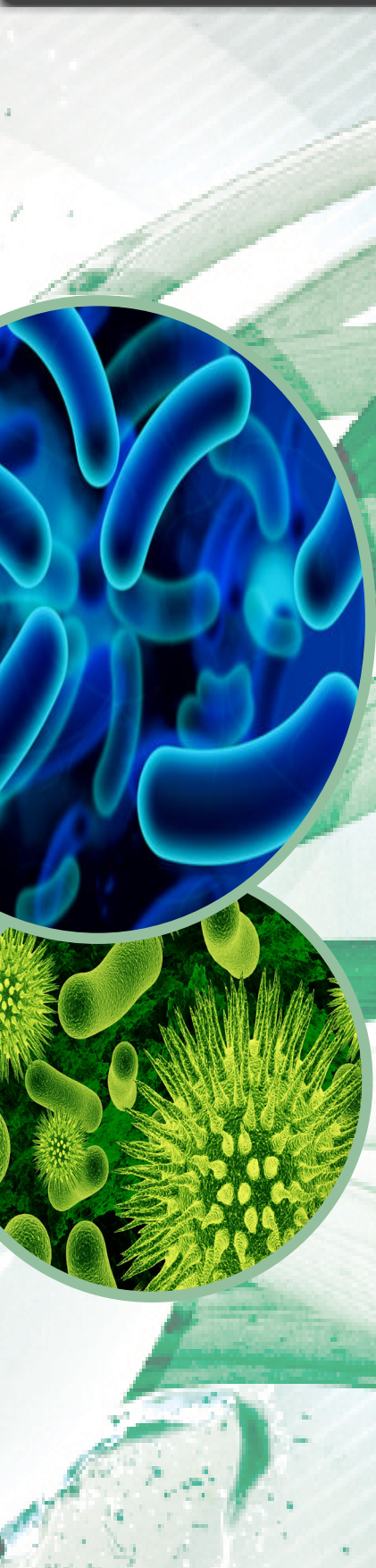


Product Formulation Guide





Preamble



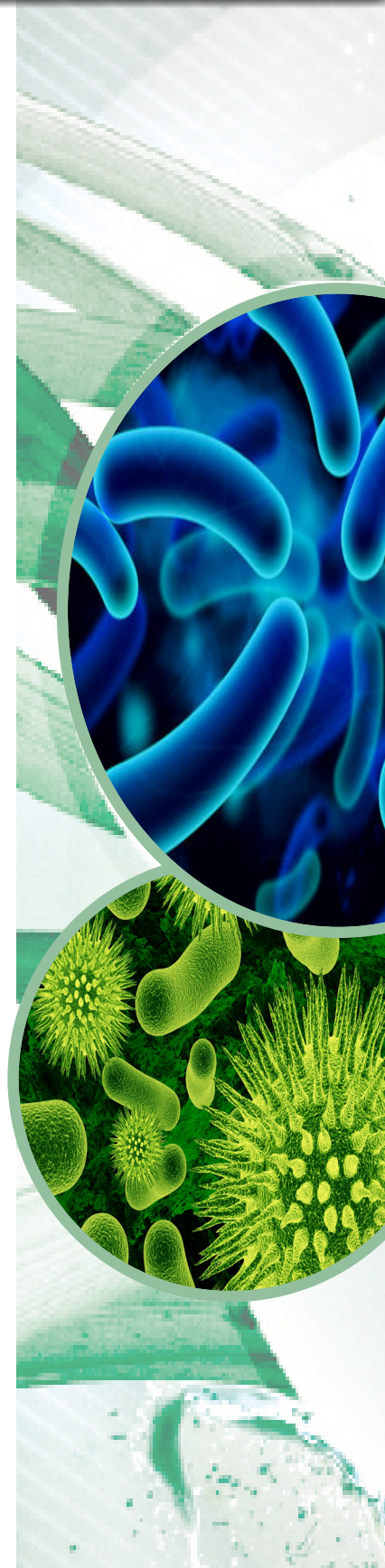
The world of cosmetic preservation is changing. The market has been driven to alternative solutions for product preservation as a result of consumer pressure and regulatory environments. Active Micro Technologies (AMT) has developed a line of products based on naturally occurring compounds that provide active cosmetic properties, but are also capable of upholding product integrity.

This document was created to address the challenges and concerns regarding our antimicrobials in the formulating process. Formulators are often challenged with natural antimicrobials, as they are newer and do not necessarily behave like synthetic preservatives. Likewise, incorporating a natural antimicrobial into a formulation is not a matter of simply removing the synthetic preservative and adding the natural antimicrobial – formulation techniques need to be tailored to each natural antimicrobial to ensure the product is properly preserved.

Preservatives may have a broader effect on the finished product, altering aesthetics such as color, odor, and viscosity. When formulating with new antimicrobials, it is important to monitor the antimicrobial closely to control undesired aesthetic changes in the finished product. An important factor to consider when formulating using most natural antimicrobials is broad-spectrum protection. It is not likely that a natural antimicrobial will exhibit the same level of broad-spectrum protection as a synthetic preservative. For this reason, natural antimicrobials often need to be used in conjunction with one another to synergistically produce a broad-spectrum self-preserving system.

This document outlines several properties of each Active Micro Technologies' product as a means to ensure compatibility during formulation, while also providing sample formulations to allow our customers to continue leading the market with impressive formulations and innovative applications.

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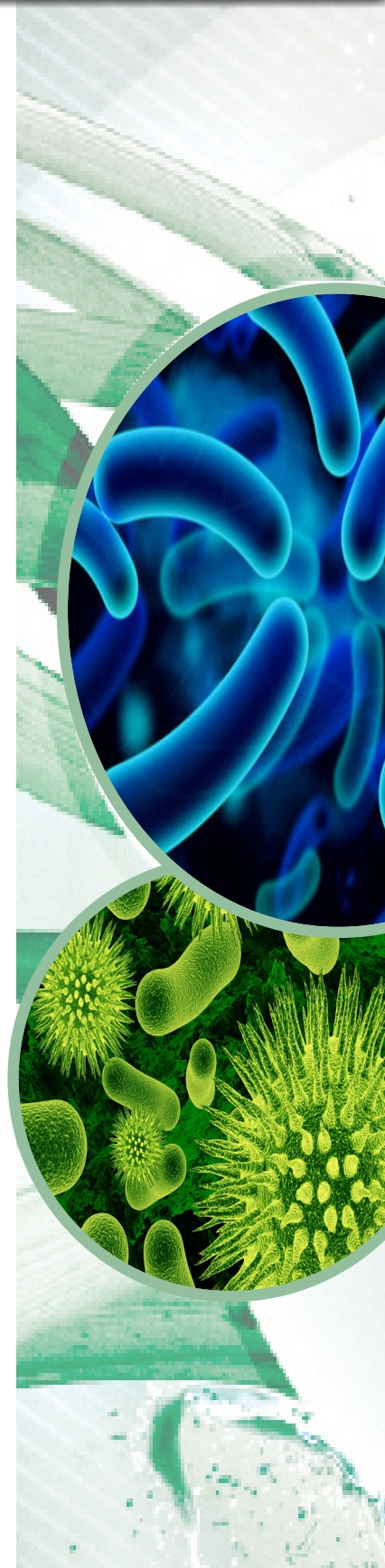
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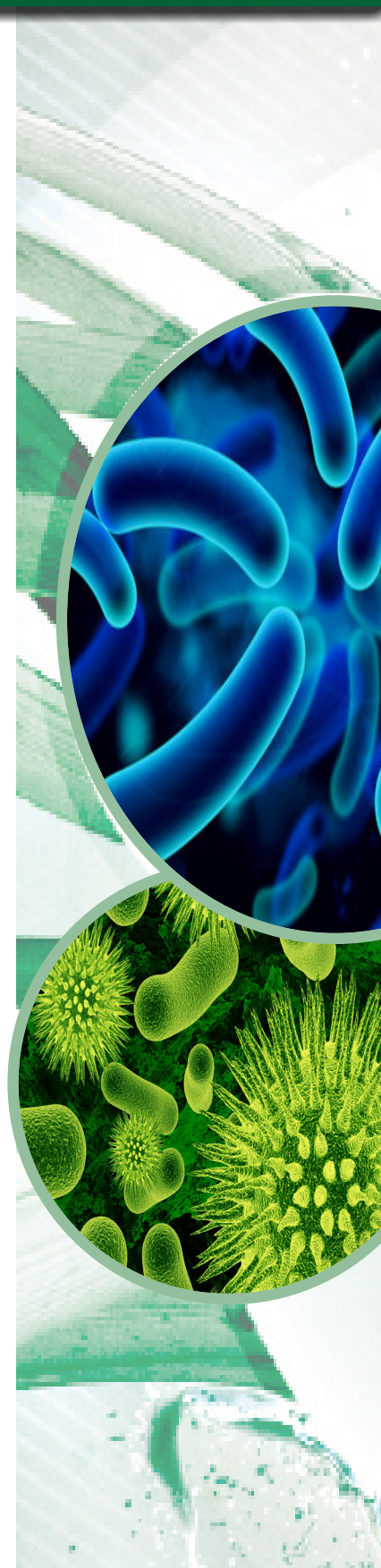
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AMTicide® Coconut

AMTicide® Coconut (M14003)

Temperature Stability	<70°C
pH Stability	3 - 8
Suggested Use Levels	2.0 - 4.0%
Solubility	Water Soluble

Quick Tips

1. We recommend coupling **AMTicide® Coconut** with one of our broad-spectrum antimicrobials, such as Leucidal® Liquid, at 4.0% each.
2. Monitor the interaction of **AMTicide® Coconut** with other ingredients for compatibility.
3. Incorporate **AMTicide® Coconut** into formulations at a pH between 3 and 8, during the cooling phase of the process at temperatures lower than 70°C.

Heat Stability

Results from testing has shown that **AMTicide® Coconut** can tolerate temperatures of up to 70°C for a period of 8 hours without having any impact on MIC performance.

Compatibility

The cationic nature of **AMTicide® Coconut** makes the main formulating concern potential incompatibility with highly anionic ingredients, such as thickeners. Reference [FAQs](#) for more information regarding specific anionic thickeners.

The use of solubilizing agents may help improve clarity in cases where haziness is observed.

Recommended Techniques

Add AMTicide® Coconut to the water phase: A successful recommendation is incorporating **AMTicide® Coconut** into the water phase of an emulsion or during cooling phase once the emulsion has been formed. Reference [FAQs](#) for techniques with anionic thickeners.

Additional Information

AMTicide® Coconut typically works well when added toward the end of the manufacturing process when the formulation temperature is below 70°C.

Leucidal® Liquid

Leucidal® Liquid (M15008)

Temperature Stability	<70°C
pH Stability	3 - 8
Suggested Use Levels	2.0 - 4.0%
Solubility	Water Soluble

Quick Tips

1. We recommend starting with 4.0% **Leucidal® Liquid**.
2. Monitor the interaction of **Leucidal® Liquid** with other ingredients for compatibility.
3. Incorporate **Leucidal® Liquid** into formulations at a pH between 3 and 8, during the cooling phase of the process at temperatures lower than 70°C.

Heat Stability

Results from testing has shown that **Leucidal® Liquid** can tolerate temperatures of up to 70°C for a period of 8 hours without having any impact on MIC performance.

Compatibility

The cationic nature of **Leucidal® Liquid** makes the main formulating concern potential incompatibility with highly anionic ingredients, such as thickeners. Reference [FAQs](#) for more information regarding specific anionic thickeners.

The use of solubilizing agents may help improve clarity in cases where haziness is observed.

Recommended Techniques

Incorporating Leucidal® Liquid towards the end of the formulating process: A successful recommendation is adding **Leucidal® Liquid** near the end of the formulating process and after the formulation has cooled to below 70°C. Reference [FAQs](#) for recommended techniques regarding specific anionic thickeners.

Additional Information

Leucidal® Liquid has been in use for almost a decade now and has been proven to be a very compatible ingredient for formulating.

Leucidal® Liquid Complete

Leucidal® Liquid Complete (M15024)

Temperature Stability	<70°C
pH Stability	3 - 8
Suggested Use Levels	2.0 - 4.0%
Solubility	Water Soluble

Quick Tips

1. We recommend starting with 4.0% **Leucidal® Liquid Complete**.
2. Monitor the interaction of **Leucidal® Liquid Complete** with other ingredients.
3. Incorporate **Leucidal® Liquid Complete** into formulations at a pH between 3 and 8, during the cooling phase of the process at temperatures lower than 70°C.

Heat Stability

Results from testing has shown that **Leucidal® Liquid Complete** can tolerate temperatures of up to 70°C for a period of 8 hours without having any impact on MIC performance.

Compatibility

The cationic nature of **Leucidal® Liquid Complete** makes the main formulating concern potential incompatibility with highly anionic ingredients, such as thickeners. Reference [FAQs](#) for more information regarding specific anionic thickeners.

The use of solubilizing agents may help improve clarity in cases where haziness is observed.

Recommended Techniques

Incorporating Leucidal® Liquid Complete towards the end of the formulating process:

A successful recommendation is adding **Leucidal® Liquid Complete** near the end of the formulating process and after the formulation has cooled to below 70°C. Reference [FAQs](#) for recommended techniques regarding specific anionic thickeners.

Additional Information

As with all biological materials, attention must be paid to the conditions under which **Leucidal® Liquid Complete** is used. Based on bench-scale evaluations, as well as actual product applications, **Leucidal® Liquid Complete** has been found to be effective over a wide range of typical cosmetic and personal care product manufacturing conditions.

Leucidal® Liquid SF

Leucidal® Liquid SF (M15019)

Temperature Stability	<70°C
pH Stability	3 - 8
Suggested Use Levels	2.0 - 4.0%
Solubility	Water Soluble

Quick Tips

1. We recommend starting with 4.0% **Leucidal® Liquid SF**.
2. Monitor the interaction of **Leucidal® Liquid SF** with other ingredients for compatibility.
3. Incorporate **Leucidal® Liquid SF** into formulations at a pH between 3 and 8, during the cooling phase of the process at temperatures lower than 70°C.
4. With viscosity modifiers, it is best to add **Leucidal® Liquid SF** prior to the thickener.

Heat Stability

Results from testing has shown that **Leucidal® Liquid SF** can tolerate temperatures of up to 85°C for a period of 8 hours without having any impact on MIC performance.

Compatibility

Anionic Ingredients: The cationic nature of **Leucidal® Liquid SF** makes the main formulating concern potential incompatibility with highly anionic ingredients like Carbopol®, Xanthan gums, Carrageenan, and Hyaluronic Acid. The haze and the presence of white particles suspended along with bubbles through the thickener solutions in **Figure 1** illustrate this incompatibility. The use of solubilizing agents, such as polysorbate 20, may help improve clarity when haziness is observed. The addition of sodium chloride or sodium citrate may help prevent a loss of viscosity when formulating with anionic ingredients. For compatibility issues regarding specific anionic thickeners, reference [FAQs](#).

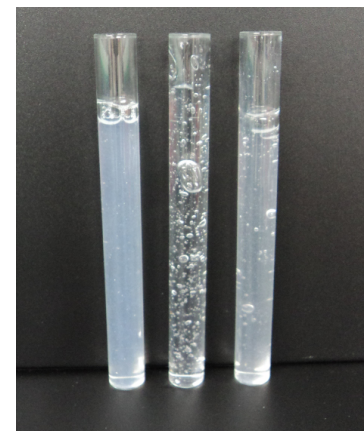


Figure 1: From left to right Keltrol® CG-SFT, Carbopol® Ultrez 10 and Carbopol® 940 with **Leucidal® Liquid SF**



Leucidal® Liquid SF

Compatibility (continued)

High salt concentration: We have had customers report that **Leucidal® Liquid SF** did not perform well in a formulation containing 10% magnesium chloride. This is an unusually high concentration of this salt for a typical cosmetic formulation. We believe the excessive amount of electrolytes in the formulation due to the 10% concentration of magnesium chloride causes saturation of the cationic antimicrobial peptides, essentially neutralizing their efficacy.

High alcohol content: Incorporating **Leucidal® Liquid SF** in a formulation with high alcohol content can cause haziness. Results from testing has shown **Leucidal® Liquid SF** to be stable and compatible in up to 20% ethanol.

Recommended Techniques

Adding Leucidal® Liquid SF towards the end of the formulating process: A successful recommendation is adding **Leucidal® Liquid SF** near the end of the formulating process and after the formulation has cooled to below 70°C. Reference [FAQs](#) for recommended techniques regarding specific anionic thickeners.

Additional Information

We have had customers report that the addition of **Leucidal® Liquid SF** before neutralizing the anionic polymers (Novethix™ L-10 Polymer and Carbopol® Aqua SF-1 OS Polymer) resulted in the formation of precipitates. These precipitates were avoided by adding **Leucidal® Liquid SF** after the neutralization of the anionic polymers.

Leucidal® SF Complete

Leucidal® SF Complete (M15025)

Temperature Stability	<70°C
pH Stability	3 - 8
Suggested Use Levels	2.0 - 4.0%
Solubility	Water Soluble

Quick Tips

1. We recommend starting with 4.0% **Leucidal® SF Complete**.
2. Monitor the interaction of **Leucidal® SF Complete** with other ingredients.
3. Incorporate **Leucidal® SF Complete** into formulations at a pH between 3 and 8, during the cooling phase of the process at temperatures lower than 70°C.

Heat Stability

Results from testing has shown that **Leucidal® SF Complete** can tolerate temperatures of up to 70°C for a period of 8 hours without having any impact on MIC performance.

Compatibility

The cationic nature of **Leucidal® SF Complete** makes the main formulating concern potential incompatibility with highly anionic ingredients, such as thickeners. Reference [FAQs](#) for more information regarding specific anionic thickeners.

The use of solubilizing agents may help improve clarity in cases where haziness is observed.

Recommended Techniques

Incorporating Leucidal® SF Complete towards the end of the formulating process: A successful recommendation is adding **Leucidal® SF Complete** near the end of the formulating process and after the formulation has cooled to below 70°C. Reference [FAQs](#) for recommended techniques regarding specific anionic thickeners.

Additional Information

As with all biological materials, attention must be paid to the conditions under which **Leucidal® SF Complete** is used. Based on bench-scale evaluations, as well as actual product applications, **Leucidal® SF Complete** has been found to be effective over a wide range of typical cosmetic and personal care product manufacturing conditions.

Leucidal® Liquid PT

Leucidal® Liquid PT (M15021)

Temperature Stability	<70°C
pH Stability	3 - 8
Suggested Use Levels	2.0%
Solubility	Water Soluble

Quick Tips

1. We recommend starting with 2.0% **Leucidal® Liquid PT**.
2. Monitor the interaction of **Leucidal® Liquid PT** with other ingredients for compatibility.
3. We recommend incorporating **Leucidal® Liquid PT** at temperatures lower than 70°C and a pH between 3 and 8.

Heat Stability

With regard to the potential negative effects of high temperatures, we have done testing to show that **Leucidal® Liquid PT** can tolerate temperatures of up to 70°C.

Compatibility

We are unaware of any adverse reactions between **Leucidal® Liquid PT** and any thickeners.

Recommended Techniques

Add Leucidal® Liquid PT to the water phase: **Leucidal® Liquid PT** is water soluble and may therefore be added to aqueous systems, as well as the aqueous phase of emulsions.

Additional Information

Leucidal® Liquid PT can also be easily incorporated into emulsion systems and water based applications. For color applications, we recommend spraying the product on the pigments along with other ingredients such as binders.

PhytoCide Elderberry OS

PhytoCide Elderberry OS (M16003)

Temperature Stability	<75°C
pH Stability	3 - 8
Suggested Use Levels	1.0 - 5.0%
Solubility	Oil Soluble

Quick Tips

1. We recommend starting with 5.0% **PhytoCide Elderberry OS**.
2. Monitor the interaction of **PhytoCide Elderberry OS** with other ingredients.
3. We recommend incorporating **PhytoCide Elderberry OS** at temperatures lower than 75°C and a pH between 3 and 8.

Heat Stability

With regard to the potential negative effects of high temperatures, we have done testing to show that **PhytoCide Elderberry OS** can tolerate temperatures of up to 75°C for a period of 8 hours without having any impact on the MIC performance.

Compatibility

PhytoCide Elderberry OS does not interact with anionic materials and, because of this, we are not aware of any adverse reactions between **PhytoCide Elderberry OS** and thickeners.

Recommended Techniques

Add PhytoCide Elderberry OS to the oil phase: **PhytoCide Elderberry OS** is oil soluble and may therefore be added to the oil phase of emulsions.

Additional Information

PhytoCide Elderberry OS is temperature stable up to 75°C and its antimicrobial properties are most effective between a pH of 3 and 8.

PhytoCide Aspen Bark Extract Powder

PhytoCide Aspen Bark Extract Powder (M16002)

Temperature Stability	<70°C
pH Stability	3 - 8
Suggested Use Levels	0.2 - 3.0%
Solubility	Water Soluble

Quick Tips

1. We recommend starting with 3.0% **PhytoCide Aspen Bark Extract Powder**.
2. Monitor the interaction of **PhytoCide Aspen Bark Extract Powder** with other ingredients.
3. We recommend incorporating **PhytoCide Aspen Bark Extract Powder** at temperatures lower than 70°C and a pH between 3 and 8.

Heat Stability

With regard to the potential negative effects of high temperatures, we have done testing to show that **PhytoCide Aspen Bark Extract Powder** can tolerate temperatures of up to 70°C.

Compatibility

PhytoCide Aspen Bark Extract Powder does not interact with anionic materials and, because of this, we are not aware of any incompatibility between the product and thickeners.

Recommended Techniques

Add PhytoCide Aspen Bark Extract Powder to the water phase: PhytoCide Aspen Bark Extract Powder is water soluble and may therefore be added to aqueous systems, as well as the aqueous phase of emulsions.

Additional Information

When using **PhytoCide Aspen Bark Extract Powder** it is recommended to maintain the formulation pH between 3 and 8 and incorporate the product at temperatures below 60°C.

PhytoCide Black Currant Powder

PhytoCide Black Currant Powder (M16001)

Temperature Stability	<75°C
pH Stability	3 - 8
Suggested Use Levels	1.0 - 3.0%
Solubility	Water Soluble

Quick Tips

1. We recommend starting with 3.0% **PhytoCide Black Currant Powder**.
2. Monitor the interaction of **PhytoCide Black Currant Powder** with other ingredients.
3. We recommend incorporating **PhytoCide Black Currant Powder** at temperatures lower than 75°C and a pH between 3 and 8.

Heat Stability

With regard to the potential negative effects of high temperatures, we have done testing to show that **PhytoCide Black Currant Powder** can tolerate temperatures of up to 75°C.

Compatibility

PhytoCide Black Currant Powder does not interact with anionic materials and, because of this, we are not aware of any adverse reactions between anionic thickeners.

Recommended Techniques

Adding PhytoCide Black Currant Powder to the water phase: PhytoCide Black Currant Powder may be added to aqueous systems, as well as the aqueous phase of emulsions.

Additional Information

When using **PhytoCide Black Currant Powder** it is recommended to maintain the formulation pH between 3 and 8 and incorporating the product at temperatures below 75°C.

SynerCide Asian Fusion

SynerCide Asian Fusion (M17001)

Temperature Stability	<70°C
pH Stability	3 - 8
Suggested Use Levels	1.0 - 2.0%
Solubility	Water Soluble

Quick Tips

1. We recommend starting with 2.0% **SynerCide Asian Fusion**.
2. Monitor the interaction of **SynerCide Asian Fusion** with other ingredients.
3. We recommend incorporating **SynerCide Asian Fusion** at temperatures lower than 70°C and a pH between 3 and 8.

Heat Stability

We have done testing to show that **SynerCide Asian Fusion** can tolerate temperatures of up to 70°C for a period of 8 hours without having any impact on MIC performance.

Compatibility

SynerCide Asian Fusion does not interact with anionic materials and, because of this, we are not aware of any adverse reactions between **SynerCide Asian Fusion** and thickeners.

Recommended Techniques

Add SynerCide Asian Fusion to the water phase: **SynerCide Asian Fusion** is water soluble and may therefore be added to aqueous systems, as well as the aqueous phase of emulsions.

Additional Information

Optimal conditions for formulating with **SynerCide Asian Fusion** include maintaining a pH between 3 and 8 and temperatures below 70°C. If formulating at temperatures higher than 70°C, it is recommended to add the ingredient on cooling after an emulsion has formed.

SynerCide Herbal Fusion

SynerCide Herbal Fusion (M17002)

Temperature Stability	<70°C
pH Stability	3 - 8
Suggested Use Levels	1.0 - 2.0%
Solubility	Water Soluble

Quick Tips

1. We recommend starting with 2.0% **SynerCide Herbal Fusion**.
2. Monitor the interaction of **SynerCide Herbal Fusion** with other ingredients.
3. We recommend incorporating **SynerCide Herbal Fusion** at temperatures lower than 70°C and a pH between 3 and 8.

Heat Stability

We have done testing to show that **SynerCide Herbal Fusion** can tolerate temperatures of up to 70°C for a period of 8 hours without having any impact on MIC performance.

Compatibility

SynerCide Herbal Fusion does not interact with anionic materials and, because of this, we are not aware of any adverse reactions between **SynerCide Herbal Fusion** and thickeners.

Recommended Techniques

Add SynerCide Herbal Fusion to the water phase: **SynerCide Herbal Fusion** is water soluble and may therefore be added to aqueous systems, as well as the aqueous phase of emulsions.

Additional Information

Optimal conditions for formulating with **SynerCide Herbal Fusion** include maintaining a pH between 3 and 8 and temperatures below 70°C. If formulating at temperatures higher than 70°C, it is recommended to add the ingredient on cooling after an emulsion has formed.

Arborcide® OC (M15010)

Temperature Stability	<70°C
pH Stability	3 - 8
Suggested Use Levels	2.0 - 4.0%
Solubility	Water Soluble

Quick Tips

1. We recommend starting with 4.0% **Arborcide® OC**.
2. Monitor the interaction of **Arborcide® OC** with other ingredients for compatibility.
3. Incorporate **Arborcide® OC** into formulations at a pH between 3 and 8, during the cooling phase of the process at temperatures lower than 70°C.

Heat Stability

With regard to the potential negative effects of high temperatures, we have done testing to show that **Arborcide® OC** can tolerate temperatures of up to 70°C.

Compatibility

We have not encountered formulating issues with **Arborcide® OC**.

Recommended Techniques

Add Arborcide® OC to the water phase: A successful recommendation is adding **Arborcide® OC** in the water phase of an emulsion or cooling phase once the emulsion has been formed.

Additional Information

As with all biological materials some attention must be paid to the conditions under which **Arborcide® OC** is used. Applications to date have shown that the material is stable up to a temperature of 70°C. Additionally, our testing has shown that **Arborcide® OC** remains active between a pH of 3 and 8.

1. What use level is best compatible for my formulation?

When formulating with our products we recommend starting with the highest suggested use level of each AMT product. As formulations are different, the use level can be adjusted down to best fit the specific needs of the formulation.

2. How do I formulate with AMT products and anionic ingredients?

2a. AMTicide® Coconut and Anionic Thickeners

Overall, 4.0% **AMTicide® Coconut** is compatible with the following thickeners: Carbomers (Carbopol® Ultrez 10; Carbopol® 940), Hyaluronic Acid, Carrageenan, and Xanthan Gum. Compatibility tests with these thickeners and **AMTicide® Coconut** were performed and the order of addition that provided the best clarity and viscosity are displayed below

4.0% AMTicide® Coconut (M14003)

Water + Viscarin® SD 389 Carrageenan + M14003

Water + Keltrol® CG-SFT + M14003

Water + Sodium Hyaluronate/Hyaluronic Acid + M14003

Water + M14003 + Carbopol® Ultrez 10

Water + Carbopol® 940 + M14003

2b. Leucidal® Liquid and Anionic Thickeners

Overall, 4.0% **Leucidal® Liquid** is compatible with the following thickeners: Carbomers (Carbopol® Ultrez 10; Carbopol® 940), Hyaluronic Acid, Carrageenan, and Xanthan Gum. Compatibility tests with these thickeners and **Leucidal® Liquid** were performed and the order of addition that provided the best clarity and viscosity are displayed below.

4.0% Leucidal® Liquid (M15008)

Water + M15008 + Viscarin® SD 389 Carrageenan

Water + M15008 + Keltrol® CG-SFT

Water + M15008 + Sodium Hyaluronate/Hyaluronic Acid

Water + M15008 + Carbopol® Ultrez 10

Water + Carbopol® 940 + M15008

2. How do I formulate with AMT products and anionic ingredients?

2c. Leucidal® Liquid Complete and Anionic Thickeners

4.0% **Leucidal® Liquid Complete** has been tested for compatibility with Carbomers (Carbopol® Ultrez 10; Carbopol® 940) and Xanthan Gum. Compatibility tests with various orders of addition deemed **Leucidal® Liquid Complete** incompatible with Carbomers. The order of addition that provided the best clarity and viscosity for Xanthan Gum is displayed below.

4.0% Leucidal® Liquid Complete (M15024)

Water + Keltrol® CG-SFT + M15024

2d. Leucidal® Liquid SF and Anionic Thickeners

Overall, 4.0% **Leucidal® Liquid SF** is compatible with the following thickeners: Carbomers (Carbopol® Ultrez 10; Carbopol® 940), Hyaluronic Acid, Carrageenan, and Xanthan Gum. Compatibility tests with these thickeners and **Leucidal® Liquid SF** were performed and the order of addition that provided the best clarity and viscosity are displayed below.

4.0% Leucidal® Liquid SF (M15019)

Water + M15019 + Viscarin® SD 389 Carrageenan

Water + M15019 + Keltrol® CG-SFT

Water + M15019 + Sodium Hyaluronate/Hyaluronic Acid

Water + M15019 + Carbopol® Ultrez 10

Water + M15019 + Carbopol® 940

2. How do I formulate with AMT products and anionic ingredients?

2e. Leucidal® SF Complete and Anionic Thickeners

4.0% **Leucidal® SF Complete** has been tested for compatibility with Carbomers (Carbopol® Ultrez 10; Carbopol® 940) and Xanthan Gum. The order of addition that provided the best clarity and viscosity for these thickeners is below.

4.0% **Leucidal® SF Complete (M15025)**

Water + M15019 + Viscarin® SD 389 Carrageenan

Water + M15019 + Keltrol® CG-SFT

3. What can be used to improve the clarity or viscosity of the solution?

Add a solubilizing agent to improve clarity: When a lipophilic peptide such as **AMTicide® Coconut (M14003)**, **Leucidal® Liquid (M15008)**, or **Leucidal® Liquid SF (M15019)** interacts with an anionic material, haze may be observed. The haze is the result of the lipophilic portion going from fully soluble to partially soluble. A solubilizing agent, such as polysorbate 20, can be used to drag the lipophilic portion back into solution and, consequently, improve clarity. Therefore if it is possible, the addition of polysorbate is recommended at a use level of $\leq 0.5\%$. If a solubilizing agent is employed, it should be incorporated after the addition of the AMT product.

Add salt to improve viscosity: In cases where this recommended procedure does not produce the desired viscosity, such as with xanthan gum, the addition of sodium chloride or sodium citrate has been shown to increase viscosity. After thorough mixing of water, salt, and **Leucidal® Liquid SF (M15019)**, the anionic ingredient is then added to the solution and agitation is continued. In the case of xanthan gum, we have found that the salt to xanthan gum ratio should be around four parts salt to each part of xanthan gum (e.g., 2.0% sodium citrate or sodium chloride to 0.5% xanthan gum). Again, care should be taken to determine the amount and duration of agitation required to produce the desired solution.

4. How compatible are AMT products with anionic ingredients?

Overall, **AMTicide® Coconut (M14003)**, **Leucidal® Liquid (M15008)**, or **Leucidal® Liquid SF (M15019)** is compatible with the following thickeners: Carbomers (Carbopol® Ultrez 10; Carbopol® 940), Hyaluronic Acid, Carrageenan, and Xanthan Gum. Compatibility testing was performed and viscosity curves were created for each anionic thickener.

4a. Carbomers

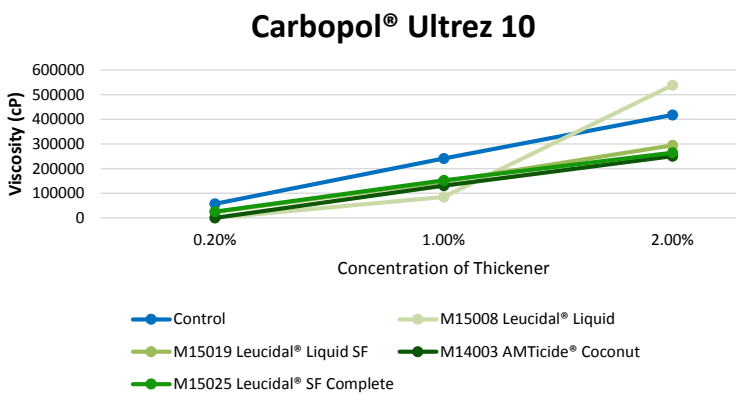


Figure 2: Viscosity Curve for Carbopol® Ultrez 10 and AMT products

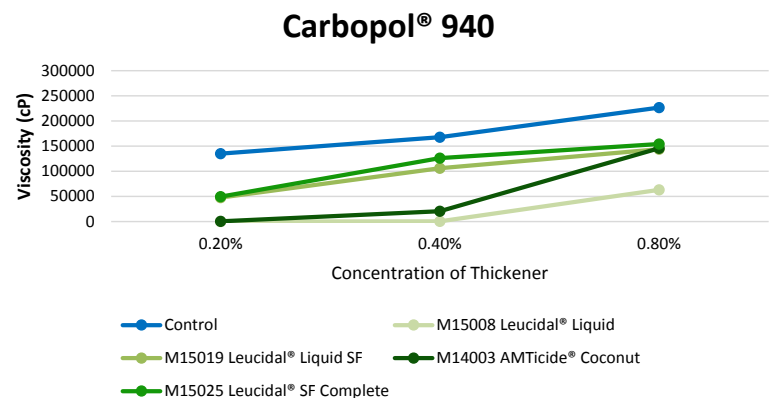


Figure 3: Viscosity Curve for Carbopol® 940 and AMT products

The order of addition for each AMT product that proved most compatible with each of the carbomers are outlined in the tables below.

Carbopol® Ultrez 10

Water + M14003 + Carbopol® Ultrez 10

Water + M15008 + Carbopol® Ultrez 10

Water + M15019 + Carbopol® Ultrez 10

Water + M15025 + Carbopol® Ultrez 10

Carbopol® 940

Water + Carbopol® 940 + M14003

Water + Carbopol® 940 + M15008

Water + M15019 + Carbopol® 940

Water + M15025 + Carbopol® 940

4. How compatible are AMT products with anionic ingredients?

4b. Xanthan Gum

Keltrol® CG-SFT

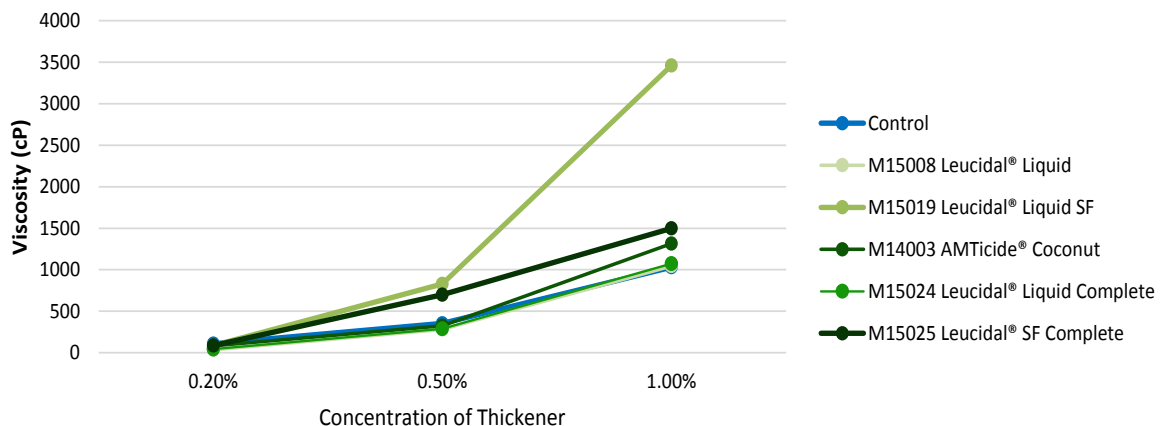


Figure 4: Viscosity Curve for Keltrol® CG-SFT and AMT products

The order of addition for each AMT product that proved most compatible with xanthan gum is outlined in the table below.

Keltrol® CG-SFT

Water + Keltrol® CG-SFT + M14003
Water + M15008 + Keltrol® CG-SFT
Water + M15019 + Keltrol® CG-SFT*
Water + Keltrol® CG-SFT + M15024
Water + M15025 + Polysorbate 20 + Keltrol® CG-SFT

*The best way to go about formulating **Leucidal® Liquid SF (M15019)** with xanthan gum is to add **Leucidal® Liquid SF (M15019)** to the water phase and then add xanthan gum. Haziness is likely to occur, but the addition of polysorbate 20 ($\leq 0.5\%$) will improve clarity. If the formulator would prefer to add **Leucidal® Liquid SF (M15019)** into the solution of xanthan gum and water, salt can be used. White flocculation occurs when **Leucidal® Liquid SF (M15019)** is added after the xanthan gum. The flocculation forms as Leucidal Liquid SF is being introduced into the xanthan gum and water solution, suggesting that it is a result of the **Leucidal® Liquid SF (M15019)** out of solution. The addition of salt ($\leq 2.0\%$ sodium chloride or sodium citrate) lowers the charge density, pulling **Leucidal® Liquid SF (M15019)** into the solution and ultimately increases the viscosity of the solution.

Information contained in this technical literature is believed to be accurate and is offered in good faith for the benefit of the customer. The company, however, cannot assume any liability or risk involved in the use of its chemical products since the conditions of use are beyond our control. Statements concerning the possible use of our products are not intended as recommendations to use our products in the infringement of any patent. We make no warranty of any kind, expressed or implied, other than that the material conforms to the applicable standard specification.

4. How compatible are AMT products with anionic ingredients?

4c. Sodium Hyaluronate/Hyaluronic Acid

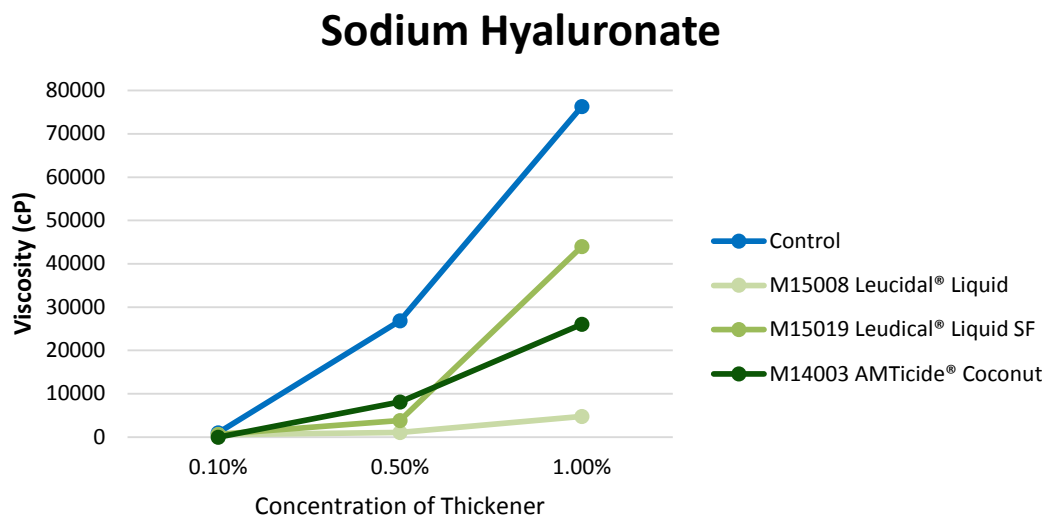


Figure 5: Viscosity Curve for Sodium Hyaluronate and AMT products

The order of addition for each AMT product that proved most compatible with sodium hyaluronate is outlined in the table below.

Sodium Hyaluronate

Water + Sodium Hyaluronate + M14003*
Water + M15008 + Sodium Hyaluronate
Water + M15019 + Sodium Hyaluronate

*When formulating **AMTicide® Coconut (M14003)** with sodium hyaluronate, the addition of polysorbate 20 ($\leq 0.5\%$) may improve clarity, however the clarity achieved may not be ideal for clear formulations.

4. How compatible are AMT products with the following anionic ingredients? (continued)

4d. Carrageenan

Viscarin® SD 389

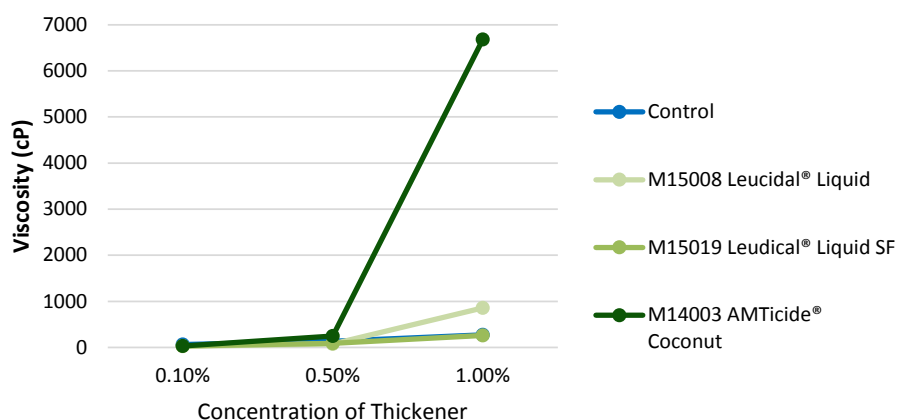


Figure 6: Viscosity Curve for Viscarin® SD 389 and AMT products

The order of addition for each AMT product that proved most compatible with carrageenan is outlined in the table below.

Viscarin® SD 389

Water + Viscarin® SD 389 Carrageenan + M14003*

Water + M15008 + Viscarin® SD 389 Carrageenan

Water + M15019 + Viscarin® SD 389 Carrageenan

*When formulating **AMTicide® Coconut (M14003)** with Viscarin® SD 389, the addition of polysorbate 20 ($\leq 0.5\%$) may improve clarity, however the clarity achieved may not be ideal for clear formulations.

Sample Formulations

I. AMTicide® Coconut (M14003)	
a. Yogurt Body Wash	27
b. Micellar Water	28
c. Cleansing Wipe Concentrate	29
d. Energizing Serum	30
e. Sulfate-Free Shampoo	31
II. Leucidal® Liquid (M15008)	
a. Yogurt Body Wash	27
III. Leucidal® Liquid Complete (M15024)	
a. Soothing Body Lotion	32
IV. Leucidal® Liquid SF (M15019)	
a. Micellar Water	28
b. Cleansing Wipe Concentrate	29
c. Energizing Serum	30
d. Sulfate-Free Shampoo	31
V. Leucidal® SF Complete (M15025)	
a. Clay Face Mask	34
b. Shine Enhancing Conditioner	36
VI. Leucidal® Liquid PT (M15021)	
a. Pressed Powder	38
VII. PhytoCide Elderberry OS (M16003)	
a. Plumping Lip Balm	39
VIII. PhytoCide Aspen Bark Extract Powder (M16002)	
a. Clarifying Toner	40
b. Split End Sealant	41
IX. PhytoCide Black Currant Powder (M16001)	
a. Moisturizing Cleanser	43
X. SynerCide Asian Fusion (M17001)	
a. Split End Sealant	41
XI. SynerCide Herbal Fusion (M17002)	
a. Clarifying Toner	40
XII. Arborcide® OC (M15010)	
a. Body Cream	44

Yogurt Body Wash

Ingredient	Trade Name/Vendor	%
Phase I		
Water	Water	24.1
Sodium Phytate	Dermofeel® PA-3/Dr. Straetmans	0.2
Phase II		
Sodium Laureth Sulfate	Steol CS-130/Stepan	30.0
Sodium Lauryl Sulfoacetate (and) Disodium Laureth Sulfosuccinate	STEPAN-MILD® LSB/Stepan	18.0
Cocamidopropyl Betaine	AMPHOSOL® CA/Stepan	10.0
Cocamidopropyl Hydroxysultaine	Chembetaine™ CAS/Lubrizol	5.0
Phase III		
Sodium Cocoyl Hydrolyzed Rice Protein	AC Foaming Rice/Active Concepts, LLC	3.0
Water (and) Yogurt Extract	ACB Yogurt Extract/Active Concepts, LLC	5.0
Phase IV		
Leuconostoc/Radish Root Ferment Filtrate	Leucidal® Liquid /Active Micro Technologies	2.0
Lactobacillus & Cocos Nucifera (Coconut) Fruit Extract	AMTicide® Coconut /Active Micro Technologies	2.0
Phase V		
Fragrance	Lavender & Vanilla Sage 302-669/American Flavors & Fragrances	0.25
PEG-150 Pentaerythrityl Tetrastearate (and) PEG-6 Caprylic/Capric glycerides (and) Water	Crothix™ Liquid/Croda	0.45

Manufacturing Process:

1. Charge water into main beaker and begin propeller mixing. A vortex should form. Begin heating to 70°C. Add Dermofeel®PA-3 and mix.
2. Switch to sweep mixing. Once temperature has reached 70°C, add each Phase II ingredient individually. Continue mixing for 15 minutes.
3. Begin force cooling. At 50°C, add each Phase III ingredient individually. Mix until homogenous.
4. At 45°C, add each Phase IV ingredient individually to main.
5. Add each Phase V ingredient individually to main.

Micellar Water

Ingredient	Trade Name/Vendor	%
Phase I		
Water	Water	85.5
Pentylene Glycol	Purolan® PD/Lanxess Distribution	3.0
Glycerin	Glycerin	2.0
Sodium Cocoyl Glycinate	GalSoft® SCG/Tri-K	0.6
PEG 7 Glyceryl Cocoate	Polymol® HE/Aqia	0.9
Glycerin and Water and Methylglucoside Phosphate and Copper Lysinate/Prolinate	NeoDermyl®/Induchem	1.0
Avena Sativa (Oat) Bran Extract	ABS Oat Extract PF/Active Concepts, LLC	1.0
Lactobacillus Ferment Filtrate	Leucidal® Liquid SF /Active Micro Technologies	2.0
Lactobacillus & Cocos Nucifera (Coconut) Fruit Extract	AMTicide® Coconut /Active Micro Technologies	2.0
Fragrance	Fragrance	q.s.

Manufacturing Process:

1. Charge water into main beaker and begin propeller mixing. Add remaining ingredients individually while stirring. Mix until homogenous.

Cleansing Wipe Concentrate

Ingredient	Trade Name/Vendor	%
Phase I		
Water	Water	53.99
Glycerin	Glycerin	8
Propylene Glycol	Propylene Glycol, USP/Spectrum Chemical	2.5
Dipropylene Glycol	Dipropylene Glycol/Spectrum Chemical	1.5
Sodium Lauroyl Sarcosinate (30% active)	GalSoft NaLS/Tri-K Industries	13.33
Ammonium Lauryl Sulfate (28% active)	STEPANOL® AM/Stepan	13.33
Polyquaternium-80	Poly Suga® Quat L-1210P/Colonial Chemical	0.25
Phase II		
Mineral Oil	Mineral Oil	2.0
Stearyl Alcohol	Stearyl Alcohol/Rita Corp.	0.5
Cetyl Alcohol	Cetyl Alcohol/Rita Corp.	0.5
Phase III		
Lactobacillus Ferment Filtrate	Leucidal®Liquid SF /Active Micro Technologies	2.0
Lactobacillus & Cocos Nucifera (Coconut) Fruit Extract	AMTicide® Coconut /Active Micro Technologies	2.0
Fragrance		0.1

Manufacturing Process:

1. Disperse the Polyquaternium-80 in rapidly agitating, room temperature water. Allow to disperse completely. Once the polymer is dispersed, heat the solution to 60-65°C until clear.
2. Add the sodium lauroyl sarcosinate, ammonium lauryl sulfate, glycerin, propylene glycol, and dipropylene glycol to the polymer solution, one at a time, in order, waiting for uniformity before adding the next. Heat the entire formulation to 60-65°C.
3. In a separate container, combine ingredients of Phase II. Heat the ingredients to 60-65°C until the fatty alcohols are dissolved. At temperature, add the contents of Phase II to Phase I with good agitation. Mix thoroughly while cooling at 45°C.
4. Add Phase III ingredients to main container. Impregnate cloths with concentrate as desired.

Energizing Serum

Ingredient	Trade Name/Vendor	%
Phase I		
Water	Water	22.8
Sodium Phytate	Dermofeel® PA-3/Dr. Straetmans	0.2
Water (and) Algae Extract	AC Alg-Moist EAU/Active Concepts, LLC	50.0
Methyl Gluceth-20	Glucam E-20/Lubrizol	1.0
Soluble Collagen	AC Soluble Collagen/Active Concepts, LLC	2.0
Water (and) Oryza Sativa (Rice) Extract	AC DermaPeptide Revitalizing/Active Concepts, LLC	4.0
Lactobacillus Bulgaricus/ White Willow Bark Extract Ferment Filtrate	Prorevive Blemish Balm Complex/ Active Concepts, LLC	2.0
Water (and) Phospholipids (and) Retinyl Palmitate (and) Ascorbyl Palmitate (and) Tocopheryl Acetate	AC Vitamin ACE Liposome/Active Concepts, LLC	1.0
Water (and) Saccharum Officinarum (Sugar Cane) Extract (and) Vaccinium Myrtillus Extract (and) Citrus Aurantium Dulcis (Orange) Fruit Extract (and) Acer Saccharum (Sugar Maple) Extract (and) Citrus Medica Limonum (Lemon Fruit) Extract	ACB Fruit Mix/Active Concepts, LLC	5.0
Water (and) Melissa Officinalis Extract	ACB Lemon Balm Extract/Active Concepts, LLC	5.0
Lactobacillus/Citrus Medica Limonum (Lemon) Peel Ferment Extract	ACB Lemon Peel Extract/Active Concepts, LLC	1.0
Lactobacillus Ferment Filtrate	Leucidal® Liquid SF/ Active Micro Technologies	4.0
Lactobacillus & Cocos Nucifera (Coconut) Fruit Extract	AMTicide® Coconut/ Active Micro Technologies	2.0

Manufacturing Process:

1. Charge water into main beaker and begin propeller mixing. A vortex should form.
2. Add each ingredient individually and allow complete dispersion.

Sulfate-Free Shampoo

Ingredient	Trade Name/Vendor	%
Phase I		
Water	Water	53.7
Glycerin	Glycerin	0.5
Tetrasodium EDTA	Versene 100/Dow Chemical	0.1
Sodium Methyl-2 Sulfolaurate and Disodium 2-Sulfolaurate, Sodium Lauryl Sulfoacetate	STEPAN-MILD® PCL/Stepan	38.0
Cocamidopropyl Betaine	AMPHOSOL® HCG/Cognis	10.0
Glyceryl Caprylate/Caprata	STEPAN-MILD® GCC/Stepan	0.3
Glycol Distearate	Hallstar®EGDS/Hallstar	0.5
Panthenol	DL-Panthenol/Roche	0.2
Phase II		
Lactobacillus Ferment Filtrate	Leucidal®Liquid SF /Active Micro Technologies	2.0
Lactobacillus & Cocos Nucifera (Coconut) Fruit Extract	AMTicide® Coconut /Active Micro Technologies	2.0
Fragrance	Green Tea & Bergamot 302-671/American Flavors & Fragrances	0.1

Manufacturing Process:

1. Charge water in main beaker, begin propeller mixing, and start heating to 60°-65°C. Add glycerin, Versene 100, STEPAN-MILD® PCL, AMPHOSOL® HCG, STEPAN-MILD®GCC, and glycol distearate using moderate agitation. Continue heating to 60°-65°C. Mix for at least 30 minutes until everything is completely dissolved.
2. Cool mixture to 40°C. Adjust mixing to minimize aeration. At 40°C, add Panthenol.
3. Add Phase II ingredients individually at 40°C. Mix until uniform and cool to room temperature.

Soothing Body Lotion

Ingredient	Trade Name/Vendor	%
Phase I		
Water	Water	54.2
Salix Alba (Willow) Bark Extract	ABS White Willow Bark Extract Powder/ Active Concepts, LLC	5.0
Sodium Phytate	Dermofeel® PA-3/Dr. Straetmans	0.2
Butylene Glycol	Butylene Glycol	2.5
Carbomer	Carbopol® Ultrez 10/Lubrizol	0.5
Phase II		
Glycerin	Glycerin	2.0
Carrageenan	Viscarin® PC 209/FMC Biopolymer	0.75
Phase III		
Tocopherol Acetate	Rita Vitamin E Acetate/Rita Corp.	0.5
Glyceryl Stearate	Protachem GMS 450/Protameen	4.0
Stearic Acid	Stearic Acid/Rita Corp.	2.0
Beeswax	Beeswax/Strahl & Pitsch	0.5
Isopropyl Palmitate	Rita IPP/Rita Corp.	0.5
Cetyl Alcohol	Cetyl Alcohol/Rita Corp.	2.25
Cocos Nucifera (Coconut) Fruit Extract	AcquaSeal® Coconut/Active Concepts, LLC	1.5
Simmondsia Chinensis (Jojoba) Seed Oil	Biomimetic Jojoba Oil Clear/Active Concepts, LLC	2.5
Helianthus Annuus (Sunflower) Seed Oil	Sunflower Oil/Arista	2.5
Phase IV		
Lactobacillus/Arundinaria Gigantea Ferment Extract	ACB Bamboo Bioferment PF/Active Concepts, LLC	10.0
Phase V		
Water	Water	2.0
Triethanolamine	TEA 99%/Rita Corp.	0.3
Phase VI		
Lactobacillus Bulgaricus Ferment Filtrate	ACB Yogurt Dermal Respiratory Factor/Active Concepts, LLC	4.0
Phase VII		
Leuconostoc/Radish Root Ferment Filtrate & Lactobacillus & Cocos Nucifera (Coconut) Fruit Extract	Leucidal® Liquid Complete /Active Micro Technologies	2.0
Phase VIII		
Fragrance	Lavender & Vanilla Sage 302-669/American Flavors & Fragrances	0.3

Soothing Body Lotion

Manufacturing Process:

1. Charge water into main beaker and begin propeller mixing. A vortex should form. Begin heating to 75°C. Sift in ABS White Willow Bark Extract Powder and mix until uniform. Add Dermofeel®PA-3 and mix until uniform. Add butylene glycol and mix until uniform. Sift in Ultrez 10 and mix until uniform.
2. In a separate beaker, pre-mix Phase II ingredients. Add Phase II to main beaker and mix.
3. In a separate beaker, blend Phase III ingredients and heat to 80°C. Once temperature has been reached, add to main. Maintain temperature of 75°C and continue mixing for 15 minutes.
4. Remove from heat. At 60°C, add ACB Bamboo Bioferment PF. Begin force cooling.
5. Pre-blend Phase V ingredients in a separate beaker. Add to main beaker at 45°C and mix.
6. Add ACB Yogurt Dermal Respiratory Factor to main beaker at 45°C. Mix until homogenous.
7. Add Phase VII ingredient to main. Mix until homogenous.
8. Add fragrance to main and mix until homogenous.



Clay Face Mask

Ingredient	Trade Name/Vendor	%
Phase I		
Water	Water	6.75
Glycerin	Glycerin	7.0
Phase II		
Caprylic/Capric Triglycerides	Neobee M-5/Stepan	3.0
Cetyl Alcohol	Cetyl Alcohol/Rita Corp.	3.0
Cetearyl Alcohol (and) Ceteareth 20	AC Emulsifying Wax C20/Active Concepts, LLC	5.0
Glyceryl Stearate	Cerasynt GMS/ISP	4.0
Behentrimonium Chloride	Varisoft BT 85/Degussa	3.0
Orbignya Oleifera Seed Oil	ACD Babassu Oil/Active Concepts Distribution	6.0
Persea Gratissima (Avocado) Oil	Avocado Oil/Arista	3.0
Euterpe Oleracea Sterols	ABS Acai Sterols EFA/Active Concepts, LLC	5.0
Phase III		
Water (and) Butylene Glycol (and) Uncaria Tomentosa Extract	ABS Cats Claw Extract BG/Active Concepts, LLC	3.0
Lactobacillus/Pumpkin Fruit Ferment Filtrate	ACB Modified Pumpkin Enzyme PF/Active Concepts, LLC	3.0
Lactobacillus/Arundinaria gigantea Ferment Filtrate	ACB Bio-Water Bamboo/Active Concepts, LLC	6.0
Water & Vaccinium Myrtillus Fruit/Leaf Extract & Saccharum Officinarum (Sugar Cane) Extract & Citrus Aurantium Dulcis (Orange) Fruit Extract & Citrus Limon (Lemon) Fruit Extract & Acer Saccharum (Sugar Maple) Extract	ACB Fruit Mix/Active Concepts, LLC	6.0
Water (and) Phospholipids (and) Tocopheryl Acetate (and) Retinyl Palmitate (and) Ascorbyl Palmitate	AC Vitamin ACE Liposome PF/Active Concepts, LLC	3.0
Water (and) Butylene Glycol (and) Saccharomyces Magnesium Ferment Extract (and) Saccharomyces Copper Ferment Extract (and) Saccharomyces Zinc Ferment Extract	ACB Bio-Chelate MCZ/Active Concepts, LLC	3.0
Lactobacillus/Arundinaria Gigantea Ferment Extract	ACB Bamboo Bioferment PF/Active Concepts, LLC	10.0
Bentonite Clay	VANATURAL®/Vanderbilt Minerals, LLC	17.0
Phase IV		
Sodium Hydroxide	NaOH 25% Solution	0.25
Phase V		
Lactobacillus Ferment & Lactobacillus & Cocos Nucifera (Coconut) Fruit Extract	Leucidal® SF Complete /Active Micro Technologies	2.0
Fragrance	Vanilla Sugar 302-668/American Flavors & Fragrances	1.0

Clay Face Mask

Manufacturing Process:

1. Charge water into main beaker and begin propeller mixing. A vortex should form. Add glycerin and begin heating to 75°C.
2. Combine Phase II ingredients in a separate beaker and heat to 80°C. Once temperature has been reached, add Phase II to main beaker and maintain temperature of 75°C.
3. Begin force cooling. In a separate beaker, combine Phase III ingredients. Once main beaker has cooled to 50°C, add Phase III ingredients.
4. Add sodium hydroxide.
5. Add Phase V ingredients individually to main.



Shine Enhancing Conditioner

Ingredient	Trade Name/Vendor	%
Phase I		
Water	Water	53.25
Water (and) Algae Extract	AC Alg-Moist EAU/Active Concepts, LLC	3.0
Sodium Phytate	Dermofeel® PA-3/Dr. Straetmans	0.2
Butylene Glycol	Butylene Glycol	3.0
Phase II		
Water (and) Trimethylolpropane Triethylhexanoate (and) Hydroxypropyltrimonium Hydrolyzed Rice Bran Protein (and) Glycerin (and) Cetearyl Alcohol (and) Cetareth-20 (and) Glyceryl Stearate (and) PEG-100 Stearate (and) Steareth-2 (and) Dimethicone (and) Ceteth-24 (and) Choleth-24	NEC Conditioning/Active Concepts, LLC	20.0
Phase III		
Behentrimonium Methosulfate (and) Cetyl Alcohol (and) Butylene Glycol	Incroquat B TMS-50/Croda	2.5
Cetearyl Alcohol	Lanette® O/Lubrizol	2.0
Phase IV		
Distearoylethyl Hydroxyethylmonium Methosulfate (and) Cetearyl Alcohol	Dehyquart® F75/Lubrizol	3.5
Phase V		
Hydrolyzed Keratin (and) Bambusa Arundinacea Leaf Extract (and) Trametes	AC Kerazyme® Protect/Active Concepts, LLC	1.5
Versicolor Extract	AC Quaternized Silk/Active Concepts, LLC	2.5
Hydroxypropyltrimonium Hydrolyzed Oryza Sativa (Rice) Protein/Siloxysilicate & Oryza Sativa (Rice) Extract	AC Split End Complex/Active Concepts, LLC	1.5
Lactobacillus/Arundinaria gigantean ferment filtrate	ACB Bio-Water Bamboo/Active Concepts LLC	5.0
Phase VI		
Lactobacillus Ferment & Lactobacillus & Cocos Nucifera (Coconut) Fruit Extract	Leucidal® SF Complete/ Active Micro Technologies	2.0
Fragrance	Lavender Vanilla Sage 302-669/ American Flavors & Fragrances	0.05

Shine Enhancing Conditioner

Manufacturing Process:

1. Charge water into main beaker and begin propeller mixing. A vortex should form. Add AC Alg-Moist EAU and Dermofeel® PA-3 and mix until uniform. Add butylene glycol and mix. Begin heating to 75°C.
2. Add NEC Conditioning at 75°C.
3. In a separate beaker, mix Phase III ingredients and heat to 80°C. Once temperature is reached, add to main beaker. Maintain main beaker at 75°C.
4. Add Phase IV ingredient at 75°C. Homogenize for 10 minutes. Begin force cooling.
5. In a separate beaker, mix Phase V ingredients. Once main beaker reaches 50°C, add Phase V ingredients to main beaker.
6. Add each Phase VI ingredient individually to main beaker.



Pressed Powder

Ingredient	Trade Name/Vendor	%
Phase I		
Mica CI 77019	Mica CI 77019/Presperse	65.44
Kaolin	Kaolin/Brenntag Specialties	5.0
Lauroyl Lysine	Amihope LL/Ajinomoto	3.0
Zinc Stearate	Zinc Stearate/Brenntag Specialties	2.0
Silica	Silica/Presperse	2.0
Titanium Dioxide CI 7789	Titanium Dioxide CI 7789/Brenntag Specialties	8.88
Iron Oxides CI 77492	Iron Oxides CI 77492/Sensient	2.1
Iron Oxides CI 77499	Iron Oxides CI 77499/Sensient	0.34
Iron Oxides CI 77491	Iron Oxides CI 77491/Color Techniques	0.74
Phase II		
Glycerin & Glycine Soja (Soybean) Seed Extract	Lysofix Liquid/Kemin	3.0
Helianthus Annus (Sunflower) Seed Oil & Rosmarinus Officinalis (Rosemary) Leaf Extract	Rosmox/Kemin	0.5
Diheptyl Succinate & Capryloyl Glycerin	LexFeel 350 N/Inolex	3.0
Helianthus Annus (Sunflower) Seed Oil	Florasun 90/Inolex	2.0
Lactobacillus Ferment	Leucidal® Liquid PT /Active Micro Technologies	2.0

Manufacturing Process:

1. Pulverize Phase I pigments, adding colors slowly to achieve desired shade.
2. Premix Phase II until uniform. Add Phase II to Phase I and pulverize until uniform. Check for oil spots.

Plumping Lip Balm

Ingredient	Trade Name/Vendor	%
Phase I		
Sorbitan Olivatate	Olivem® 900/HallStar	15.0
Hydrogenated Olive Oil (and) Olea Europaea (Olive) Fruit Oil (and) Olea Europaea (Olive) Oil Unsaponifiables	Oliwax®/HallStar	3.0
Octyldodecanol	Octyldodecanol	22.0
Simmondia Chinensis (Jojoba) Seed Oil	Biomimetic Jojoba Oil/Active Concepts, LLC	22.0
Ricinus Communis (Castor) Seed Oil		21.0
Ethylhexyl Palmitate (and) Silica Dimethyl Silylate (and) Butylene Glycol (and) Gamma Aminobutyric Acid (and) Caprylyl Glycol (and) Phenoxyethanol (and) Hexylene Glycol (and) Sodium Hyaluronate	AC NanoVector Plump GABA HYA/Active Concepts	3.0
Beeswax	Beeswax	5.0
Microcrystalline Wax	MetaBeads® MicroWax/FloraTech	5.0
Sambucas nigra Fruit Extract	PhytoCide Elderberry OS /Active Micro Technologies	2.0
Iron Oxide	Iron Oxide	1.0
Cocos Nucifera (Coconut) Fruit Extract	AcquaSeal® Coconut/Active Concepts, LLC	1.0
Fragrance		

Manufacturing Process:

1. Melt the waxes in the oils and mix the pigments until a homogenous dispersion.
2. Add the fragrance and pour the gloss in the container.

Clarifying Toner

Ingredient	Trade Name/Vendor	%
Phase I		
Water	Water	76.9
Populus Tremuloides (Aspen) Bark Extract	PhytoCide Aspen Bark Extract Powder/ Active Micro Technologies	2.0
Aloe Barbadensis Leaf Extract	ABS Aloe Powder/Active Concepts, LLC	0.5
Selaginella Lepidophylla Extract	PhytoFuse Renew™/Active Concepts, LLC	2.0
Phase II		
Water & Hamamelis Virginiana (Witch Hazel) Bark/ Leaf/ Twig Extract	ABS Witch Hazel Extract/Active Concepts, LLC	5.0
Lactobacillus/Rice Ferment Filtrate	ACB Rice Bioferment/Active Concepts, LLC	5.0
Water (and) Propylene Glycol (and) Cucumis Sativus (Cucumber) Fruit Extract	ABS Cucumber Extract/Active Concepts, LLC	3.0
Water (and) Prunus Amygdalus Dulcis (Sweet Almond) Seed Extract	AC DermaPeptide Lifting/Active Concepts, LLC	2.0
Lactobacillus/Dipteryx Odorata Seed Ferment Filtrate	ACB Tonka Bean Bioferment/Active Concepts, LLC	1.5
Water (and) Caprylyl Glycol (and) Hexylene Glycol (and) Origanum Vulgare (Oregano) Leaf Extract (and) Thymus Vulgaris (Thyme) Leaf Extract (and) Rosmarinus Officinalis (Rosemary) Leaf Extract	SynerCide Herbal Fusion/ Active Micro Systems	2.0
Phase III		
Fragrance	Simply Orchid V S8-43295/Premier Specialties Inc.	0.1

Manufacturing Process:

1. Charge water into main beaker and begin propeller mixing. A vortex should form. Sift in PhytoCide Aspen Bark Extract Powder and mix until uniform. Add remaining Phase I ingredients individually and mix until homogenous.
2. In a separate beaker, combine Phase II ingredients and mix well. Then add to main beaker and mix until homogenous.
3. Add fragrance and mix until homogenous.

Split End Sealant

Ingredient	Trade Name/Vendor	%
Phase I		
Water	Water	74.45
Sodium Phytate	Dermofeel®PA-3/Dr. Straetmans	0.1
Populus Tremuloides (Aspen) Bark Extract	PhytoCide Aspen Bark Extract Powder / Active Micro Technologies	2.0
Panthenol	Panthenol	0.1
Phase II		
Cetrimonium Chloride	Ammonyx Cetac-30/Stepan	1.0
Xanthan Gum	Keltrol CG	1.0
Phase III		
Polysorbate 20	Polysorbate 20/Spectrum	1.0
Squalane	ABS Amaranthus Squalane/Active Concepts, LLC	0.5
Phase IV		
Cyclopentasiloxane (and) Polymethylsilsesquioxane	SilDerm® Emulsifying CS/Active Concepts, LLC	3.0
Cyclomethicone (and) Hydrolyzed Silk	AC Silk Hydrolysate/Active Concepts, LLC	2.0
Cyclomethicone & Dimethicone	SilDerm® Smoothing/Active Concepts, LLC	2.0
Phase V		
Hydroxypropyltrimonium Hydrolyzed Oryza Sativa (Rice) Protein/Siloxysilicate (and) Oryza Sativa (Rice) Extract	AC Split End Complex/Active Concepts, LLC	5.0
Keratin Amino Acids	AC Keratin Amino Acids/Active Concepts, LLC	3.0
Water (and) Saccharomyces Zinc Ferment (and) Saccharomyces Copper Ferment (and) Saccharomyces Magnesium Ferment (and) Saccharomyces Iron Ferment (and) Saccharomyces Silicon Ferment	ACB Bio-Chelate 5/Active Concepts, LLC	2.0
Phase VI		
Water (and) Caprylyl Glycol (and) Hexylene Glycol (and) Wasabia Japonica (Wasabi) Root Extract (and) Zingiber Officinale (Ginger) Root Extract (and) Allium Sativum (Garlic) Bulb Extract	SynerCide Asian Fusion /Active Micro Technologies	2.0
Fragrance	Sea Spray 302-673/American Flavors & Fragrances	0.2
Phase VII		
Triethanolamine	TEA 99%/Rita Corp.	0.2
Phase VIII		
Citric Acid	Citric Acid (50% solution)	0.4
Acrylates Copolymer	Carbopol®Aqua SF-1/Noveon	0.05

Split End Sealant

Manufacturing Process:

1. Charge water into main beaker and begin propeller mixing. A vortex should form. Add remaining Phase I ingredients and mix until homogenous.
2. Pre-mix cetrimonium chloride and xanthan gum in a separate beaker. Slowly add these Phase II ingredients to main and mix until homogenous.
3. In a separate beaker, combine Phase III ingredients. Then add to main beaker and mix until homogenous.
4. In a separate beaker, combine Phase IV ingredients. Add to main beaker and mix until homogenous.
5. In a separate beaker, combine Phase V ingredients. Add to main beaker and mix until homogenous.
6. Add Phase VI ingredients to main and mix until homogenous.
7. Add triethanolamine and mix until homogenous.
8. Add citric acid and acrylates copolymer and mix until homogenous. Final pH should be 5.15.



Moisturizing Cleanser

Ingredient	Trade Name/Vendor	%
Phase I		
Water	Water	51.8
Ribes nigrum (Black Currant) Fruit Extract	PhytoCide Black Currant Powder/ Active Micro Technologies	2.0
Phase II		
Sodium Lauryl Sulfoacetate (and) Disodium Laureth Sulfosuccinate	STEPAN-MILD® LSB/Stepan	20.95
Cocamidopropyl Betaine	AMPHOSOL® HCG/Stepan	10.0
Cocoamide DEA	NINOL® 40-CO/Stepan	4.0
Phase III		
Water (and) Propylene Glycol (and) Cucumis Sativus (Cucumber) Fruit Extract	ABS Cucumber Extract/Active Concepts, LLC	5.0
Hydrolyzed Rice Protein	AC DermaPeptide Revitalizing/Active Concepts, LLC	3.0
Hydroxypropyltrimonium Hydrolyzed Rice Protein	AC Quaternized Rice/Active Concepts, LLC	1.0
Water (and) Palaenopsis Amabilis Extract	ABS White Orchid Milk/ Active Concepts, LLC	0.05
Phase IV		
Sodium Hydroxide	Sodium Hydroxide 25% Solution	0.6
Phase V		
Sodium Chloride	Sodium Chloride	1.5
Phase VI		
Fragrance	Simply Orchid V S8-43295/Premier Specialties Inc.	0.1

Manufacturing Process:

1. Charge water into main beaker and begin propeller mixing. A vortex should form. Sift in PhytoCide Black Currant Powder and begin heating to 75°C. Mix until homogeneous.
2. Switch to sweep mixing. At 75°C, add each Phase II ingredient individually. Allow each ingredient to disperse completely before adding the next. Begin force cooling.
3. Pre-mix Phase III ingredients in a separate vessel. When main beaker reaches 45°C, add Phase III ingredients and mix until homogenous.
4. Add sodium hydroxide and mix until homogenous.
5. Add sodium chloride and mix until homogenous.
6. Add fragrance and mix until homogenous.

Ingredient	Trade Name/Vendor	%
Phase I		
Water	Water	78.2
Phase II		
Glycerin	Glycerin	2.0
Xanthan Gum	Keltrol® CG-SFT	0.3
Phase III		
Cetearyl Alcohol & Glyceryl Stearate & Coceth-20	PhytoMulse™ Coconut/ Active Concepts, LLC	6.0
Cocos Nucifera (Coconut) Fruit Extract	AcquaSeal® Coconut/Active Concepts, LLC	6.0
Simmondsia Chinensis (Jojoba) Seed Oil	Biomimetic Jojoba Oil/Active Concepts, LLC	4.0
Cera alba	Organic Beeswax	1.0
Phase IV		
Leuconostoc Ferment Filtrate	Arborcide® OC /Active Micro Technologies	2.0
50% Citric Acid Solution	50% Citric Acid Solution	0.1
Phase V		
Fragrance	Natural Organic Citrus Mandarin Jasmine Blend S7-38867/Premier	0.4

Manufacturing Process:

1. Charge water into main beaker and begin propeller mixing. Begin heating to 75°C.
2. In a separate beaker, combine Phase III ingredients and heat to 75°C while mixing. Mix until homogenous.
3. Premix Phase II, then add to main beaker when water reaches 75°C and mix until homogenous.
4. Add Phase III to main beaker with high-speed mixing. Maintain temperature at 75°C and mix for 3 minutes.
5. Homogenize batch for 3-5 minutes. Begin force cooling.
6. At 45°C, add Phase IV and mix until homogenous.
7. Add Phase V and mix until homogenous.