

*The planet is ready for  
100% Natural Quat-Free and  
Biodegradable Conditioning...*

***Are you?***



AminoSensyl™

HC



# AminoSensyl™ HC Breakthrough Technology

AminoSensyl™

## Eco-Friendly

- ✓ Renewable Sources
- ✓ Quat-Free
- ✓ Readily Biodegradable

## High Performance

- ✓ Conditions
- ✓ Strengthens
- ✓ Smooths & Defines

## 100% Natural

- ✓ Essential Amino Acid
- ✓ Brassica Alcohol
- ✓ Green Chemistry

## Scientific Innovation

- ✓ Amphiphilic and Cationic Amino Lipid
- ✓ Patented Technology





**Green Chemistry for  
Sustainable Innovation  
in Hair Care Actives**



# Hair Care Opportunities focus on Sustainable Ingredients



## Global Opportunities Hair Care

Nascent and emerging ingredients

**Probiotics**, **vegetables** (eg broccoli, cabbage) and **micelles** are a few underused ingredients that can expand and appeal to interest in natural, gentle and microbiome-friendly formulas. Promoting the use of **sustainable ingredients** can also expand and address concerns over the depletion of natural resources as demand for naturals rises.

Blur with food and promote sustainable ingredients

Natural NPD can tap into two key Mintel BPC Trends in order to expand. *Gastronomia* focuses on the blurring between food and beauty markets, and *Playing Mother Nature* discusses how natural brands need to use local approaches and sustainable ingredients to ensure natural resources aren't depleted as demand rises.

## Europe & Americas Opportunities Hair Care



# Green Chemistry at INOLEX



At INOLEX, innovation is guided by the **principles of green chemistry** and **life cycle thinking**. Our goal is to provide ingredients that deliver objective, measurable improvements in performance, consumer preference, AND sustainability.

## Key strategies:

- Effective use of renewable, plant-based feedstocks; pursuit of new bio-based alternatives
- Safe, simple chemistry with sophisticated performance
- Articulating and minimizing trade-offs to avoid hidden costs/consequences of “*natural*”

Anastas, P. T.; Warner, J. C. Green Chemistry: Theory and Practice, Oxford University Press: New York, 1998, p. 30.

# Amino Lipids Technology Platform



**Proprietary Technology Platform** for development of **tailored and high performance** amino lipids with **superior environmental and safety profiles**

## Building Blocks of **INOLEX Amino Lipids:**

### **Amino Acid**

- ✓ Derived from biofermentation
- ✓ Contains amine functionality
- ✓ Provides a natural cationic charge

### **Fatty Alcohol**

- ✓ Derived from renewable plant oil
- ✓ Contains hydrophobic carbon chain
- ✓ Plant oils chosen for desired mixture of carbon chain lengths

## Key Features of **INOLEX Amino Lipids:**

- ✓ 100% Natural
- ✓ Non-Quat Cationic Charge
- ✓ Based on Amino Acid
- ✓ Patented Hair Care Actives



# AminoSensyl™ HC Innovative Technology Design



## Essential Amino Acid - **Valine:**

- ✓ Derived from biofermentation of sugarcane glucose
- ✓ Provides a natural cationic charge for hair substantivity
- ✓ Valine occurs naturally on the cuticle of hair

## Fatty Alcohol - **Brassica Alcohol:**

- ✓ Derived from the *Brassica Napus* seed oil
- ✓ Genus *Brassica* contains a variety of nutrient rich plants
- ✓ Provides an optimized mixture of C18 – C22 carbon chains for conditioning & strengthening performance

## **INCI:**

Brassica Alcohol (and) Brassicyl Valinate Esylate



# AminoSensyl™ HC is Eco-Friendly



- Developed and manufactured according to the **Principles of Green Chemistry**
- **100% renewable and sustainable** raw material feedstocks
- **Solvent-free** manufacturing process
- **No heavy metal catalysts** and moderate reaction temperatures for **low energy consumption**
- **Water is the only reaction by-product**
- Brassicyl Valinate Esylate is **readily biodegradable**
- **Non toxic** and **Non irritating**



# Amino Lipids have Superior Safety and Environmental profiles

		Cationic Amino Lipids	Quaternary Surfactants	Amidoamines
		e.g. Brassicyl Valinate Esylate	e.g. Behentrimonium Chloride	e.g. Stearamidopropyl Dimethylamine
Irritation Potential to Skin and Eyes	Increases with decreasing alkyl chain length	Non-hazardous	 IRRITANT	 SKIN CORROSION
Aquatic Toxicity	Potentially toxic to fish, invertebrates, algae	Non-hazardous	 AQUATIC TOXICITY	 AQUATIC TOXICITY
Environmental Persistence	Increases with increasing alkyl chain length (i.e. increasing hydrophobicity)	Readily Biodegradable	~80% Biodegradable	Readily Biodegradable
Petro-chemical derived carbon	Quaternary ammonium head groups rely on petrochemical-derived carbon	 100% NATURAL	 PETRO DERIVED	 PETRO DERIVED

## REFERENCES

- Safety Assessment of Trimoniums as Used In Cosmetics, 2012.
- SCCS Opinion on Alkyl (C16, C18, C22) Trimethylammonium Chloride, 2009.
- Ecotoxicological Behavior of some Cationic and Amphoteric Surfactants, 2013.
- ECHA Substance Information, [www.echa.europa.eu](http://www.echa.europa.eu), 2019.

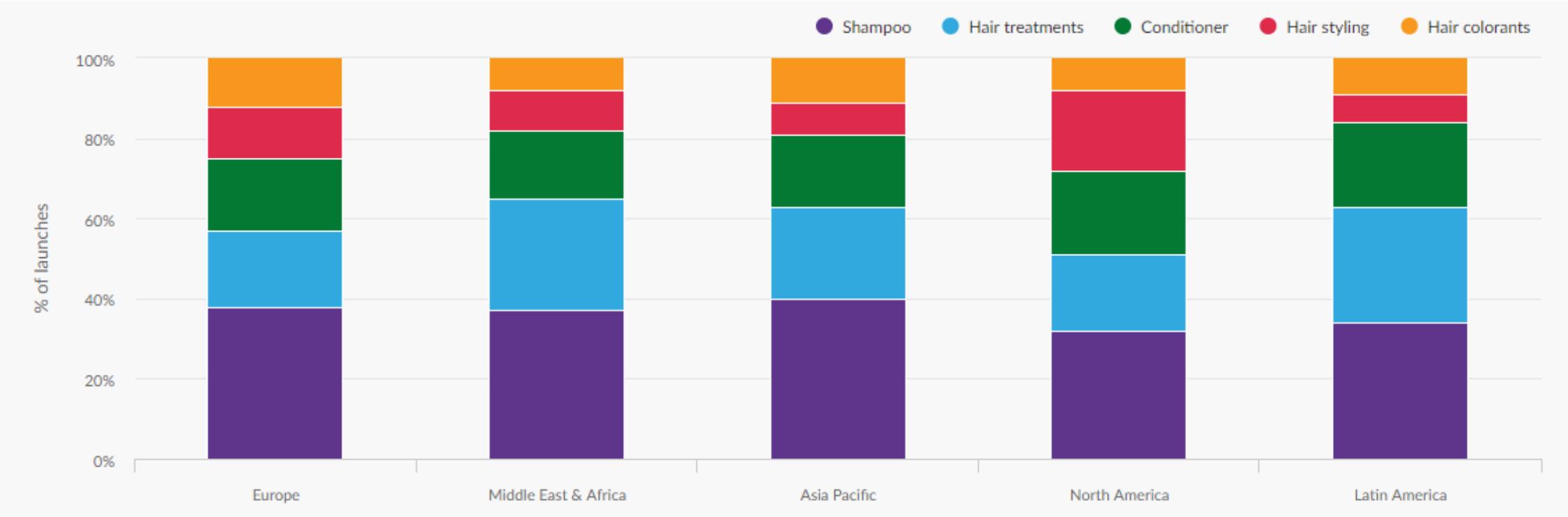




***High Performance  
Conditioning for  
All Hair Types***



# Conditioning & Treatment Markets are Globally Significant

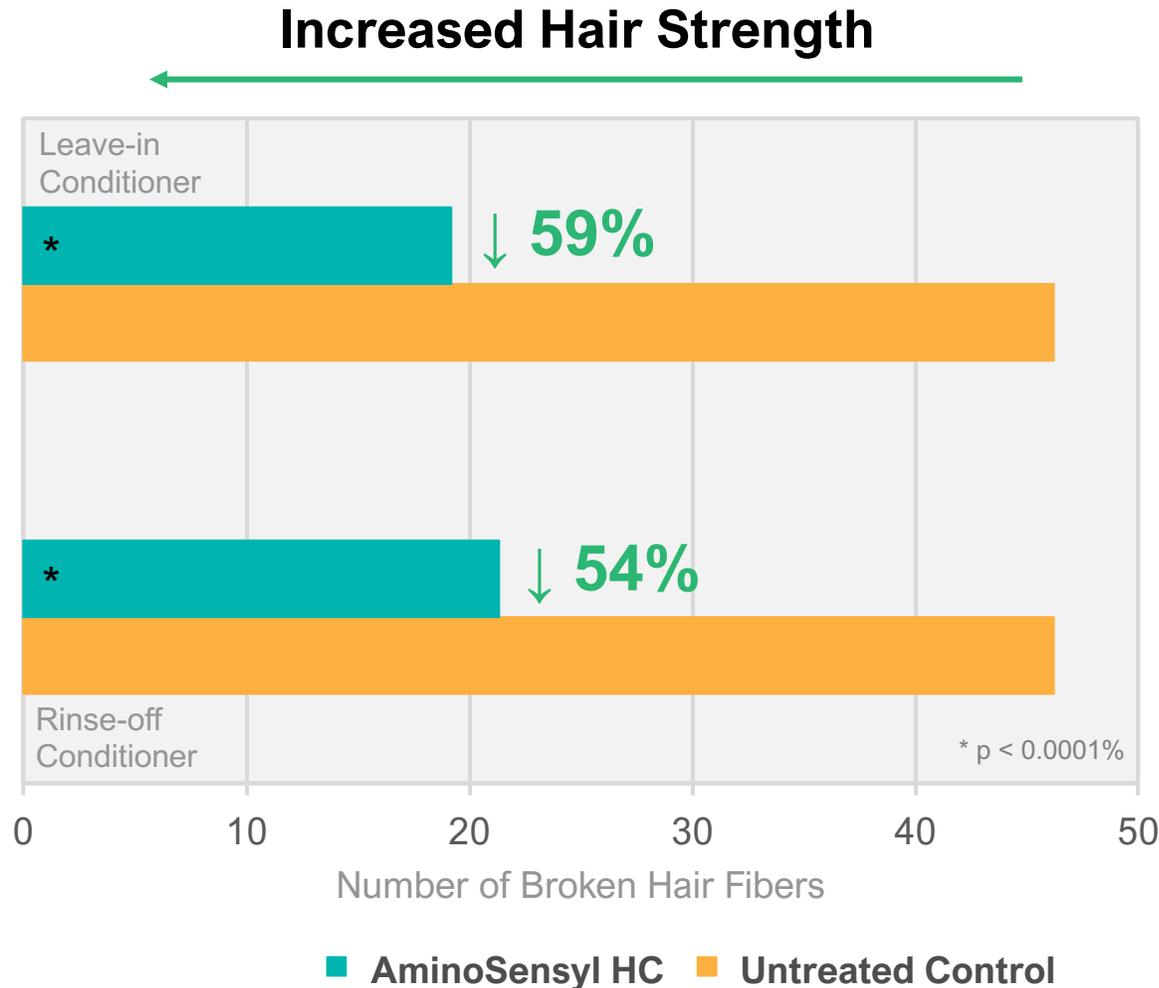


- ✓ Hair Conditioning and Hair Treatment markets are significant in all regions
- ✓ Hair Treatment market in LATAM is larger than Hair Conditioning market

A Year of Innovation in Hair Care, Mintel Report, May 2018



# AminoSensyl™ HC Strengthens Hair to Resist Breakage



## Anti-Breakage Test AminoSensyl HC:

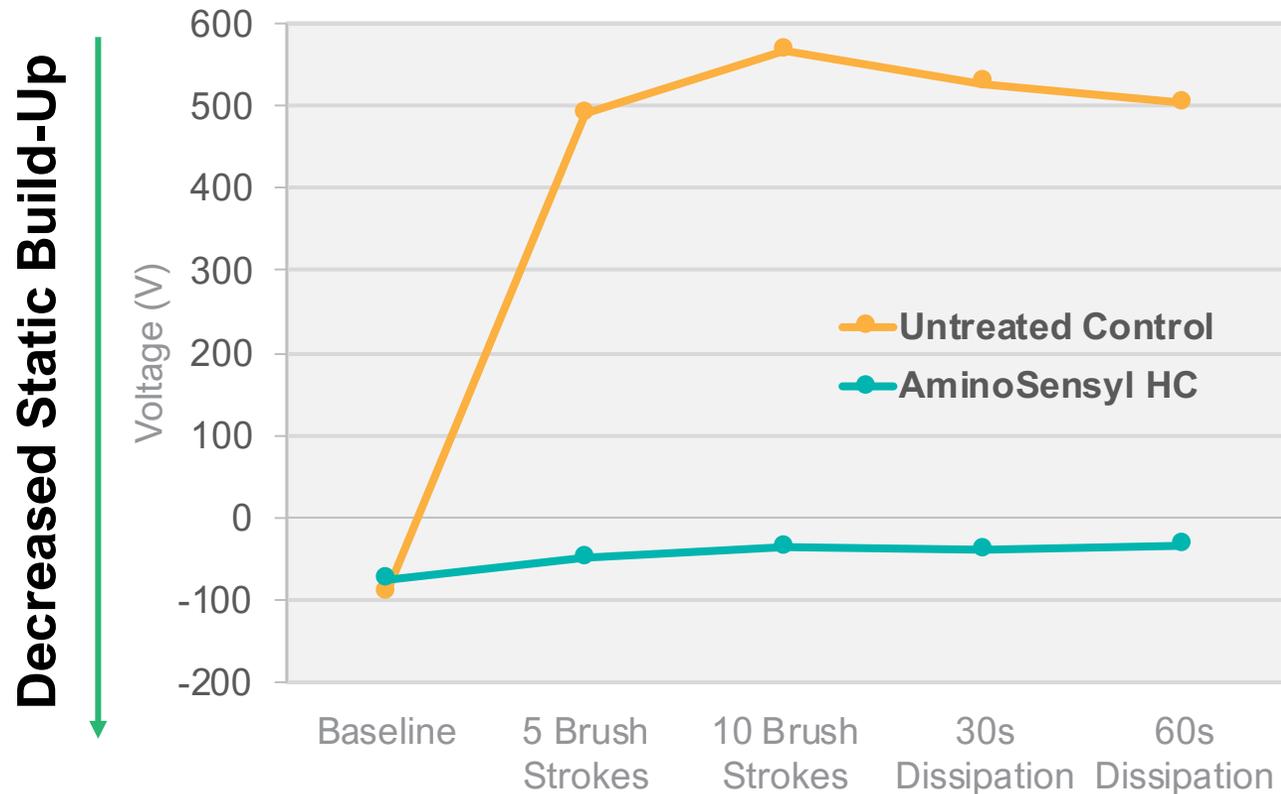
- ✓ Significant reduction in hair breakage from both rinse-off and leave-in conditioners
- ✓ 54% (2X) increase in hair strength in a rinse-off conditioner application
- ✓ 59% (2X) increase in hair strength in a leave-in conditioner application

### Test Method:

- Anti-Breakage Benefits via Repeated Grooming with Custom-Built Automatic Groomer
- Study performed by TRI/Princeton
- European medium brown hair tresses, bleached, 10 replicate tresses
- Test Formulation: 8% w/w AminoSensyl HC in water; pH ~4.0
- Rinse-Off Treatment procedure: (1) SLES wash, (2) 3 minute conditioner application, (3) 30s rinse
- Leave-In Treatment procedure: (1) SLES wash, (2) Conditioner application
- Tresses were dried and allowed to equilibrate at 60% RH, 22°C
- Dry tresses are groomed for 2,000 cycles. Fibers are collected and assessed every 200 cycles.



# AminoSensyl™ HC Creates a Smooth and Defined Appearance



## Static Build-Up Test AminoSensyl™ HC:

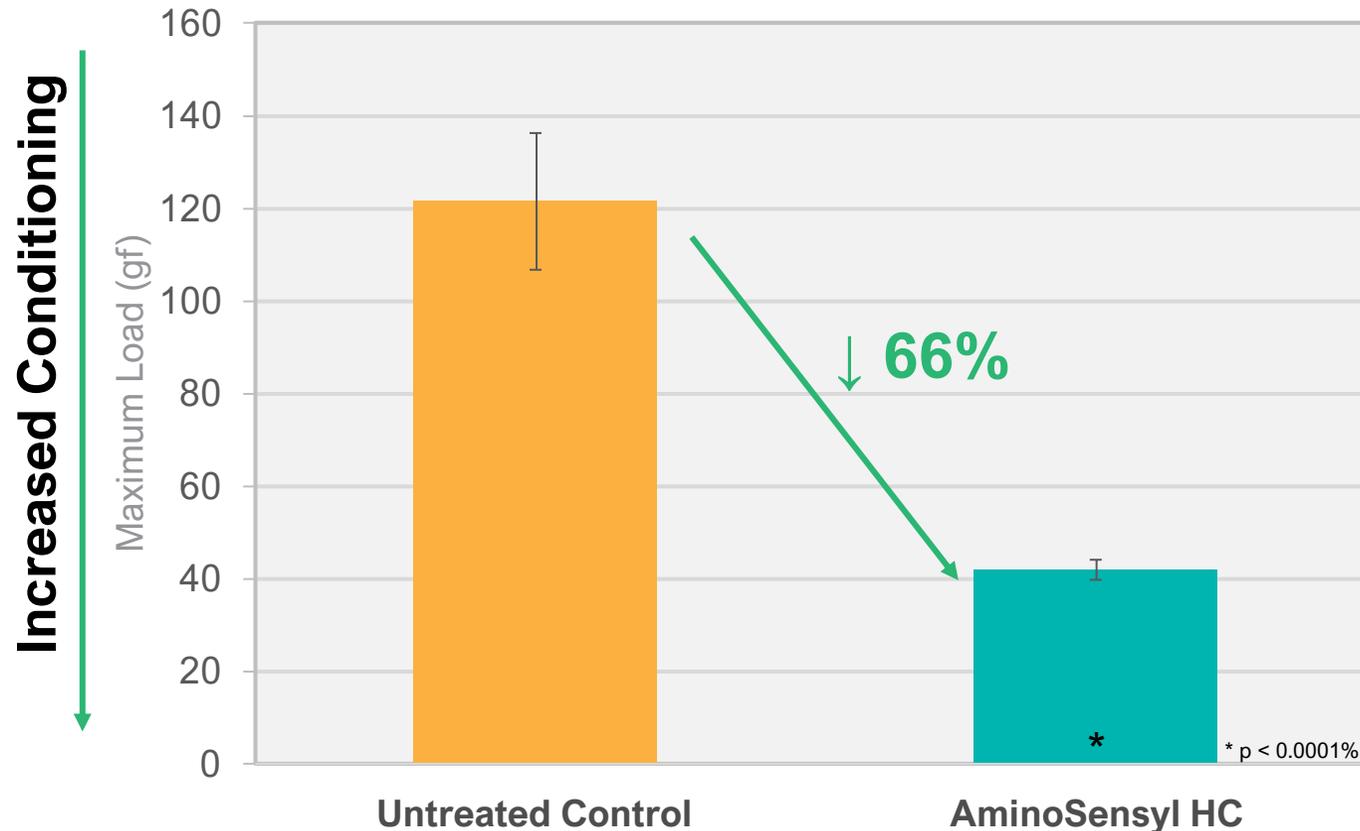
- ✓ Hair moisturization in low humidity environment
- ✓ Resists static build up from brushing
- ✓ Cationic active deposits on damaged hair due to cationic charge and optimized C18-22 carbon chain lengths
- ✓ Provides a smooth and defined appearance

### Test Method:

- Anti-Static Charge using custom-built device with sensor for real-time measurement
- Study performed by TRI/Princeton
- European medium brown hair tresses, 8 replicate tresses
- Treatment procedure: (1) SLES wash, (2) 3 minute conditioner application, (3) 30s rinse
- Tresses were dried and allowed to equilibrate at 30% RH
- Test Formulation: 8% w/w AminoSensyl HC in water; pH ~4.0



# AminoSensyl™ HC Conditions Damaged Hair



## Wet Comb Test AminoSensyl™ HC:

- ✓ 66% decrease in wet comb force
- ✓ Significant conditioning of damaged hair
- ✓ Low use level: 2% w/w active cationic conditioning agent

### Test Method:

- Measurement of Wet Combing Forces using Instron tensile tester, Study performed by TRI/Princeton
- European medium brown hair tresses, bleached; 8 replicate tresses
- Treatment procedure: (1) SLES wash, (2) 3 minute conditioner application, (3) 30s rinse
- Combing experiments performed in the wet state, 6 comb strokes per tress
- Test Formulation: 8% w/w AminoSensyl HC in water; pH ~4.0

# Intensive Conditioning Bar

Trade Name	Ingredient (INCI)	%(w/w)
<b>AminoSensyl™ HC<sup>1</sup></b>	<b>Brassica Alcohol (and) Brassicyl Valinate Esylate</b>	<b>90.00</b>
<b>LexFeel® N5 MB<sup>1</sup></b>	<b>Diheptyl Succinate (and) Capryloyl Glycerin/Sebacic Acid Copolymer</b>	1.00
Coconut Oil	Cocos Nucifera (Coconut) Oil	3.00
Shea Butter	Butyrospermum Parkii (Shea) Butter	3.00
<b>Spectrastat™<sup>1</sup></b>	<b>Caprylhydroxamic Acid (and) Caprylyl Glycol (and) Glycerin</b>	1.00
Glycerin	Glycerin	1.00
Pink Salt & Water Lilly <sup>2</sup>	Fragrance	1.00
		<b>100.00</b>
<sup>1</sup> INOLEX <sup>2</sup> Lebermuth		<b>HC-1101</b>

A sustainable take on a traditional conditioner, this waterless and easy-rinse bar is highly concentrated with amino acid based conditioning agent, **AminoSensyl™ HC**.

This creamy conditioner provides deep moisturization to combat damage and dryness for healthier, nourished tresses.



# Curl Defining Spray

Trade Name	Ingredient (INCI)	%(w/w)
<b>AminoSensyl™ HC<sup>1</sup></b>	<b>Brassica Alcohol (and) Brassicyl Valinate Esylate</b>	<b>7.50</b>
<b>LexFeel® WOW-A<sup>1</sup></b>	<b>Triheptanoin (and) C13-15 Alkane</b>	1.00
<b>LexFeel® N350 MB<sup>1</sup></b>	<b>Diheptyl Succinate (and) Capryloyl Glycerin/Sebacic Acid Copolymer</b>	2.00
Avocado Oil <sup>3</sup>	Persea Gratissima (Avocado) Oil	2.00
Deionized Water	Deionized Water	82.70
Glycerin	Glycerin	3.00
<b>Spectrastat™ G2 Natural MB<sup>1</sup></b>	<b>Caprylhydroxamic Acid (and) Glyceryl Caprylate (and) Glycerin</b>	1.00
<b>PhytoTrace™ Saffron<sup>2</sup></b>	<b>Crocus Sativus (Saffron) Flower Extract (and) Glycerin (and) Water</b>	0.25
<b>PhytoTrace™ Rice<sup>2</sup></b>	<b>Oryza Sativa (Rice) Extract (and) Glycerin (and) Water</b>	0.25
Perfume Essence N26275 <sup>4</sup>	Fragrance	0.30
		<b>100.00</b>
<sup>1</sup> INOLEX <sup>2</sup> INOLEX Provence <sup>3</sup> Now Solutions <sup>4</sup> Carrubba		<b>HC-1100</b>

A leave-in conditioner spray that creates smoother and more defined curls. Quat-free **AminoSensyl™ HC** provides safe, nourishing conditioning without weighing hair down, ideal for a bouncy and hydrated natural curl.



# Curl Definition and Smoothed Appearance from AminoSensyl™ HC



Conditioned with  
AminoSensyl™ HC  
and  
Curl Defining  
Spray

Untreated

**AminoSensyl™ HC formulations provide consumer-perceivable benefits on hair**

European virgin curly hair treated with **AminoSensyl™ HC Intensive Conditioning Bar and Curl Defining Spray** has a smoother and more defined appearance with a tighter curl.



# Curl Definition and Smoothed Appearance from AminoSensyl™ HC



Conditioned with  
AminoSensyl™ HC  
and  
Curl Defining  
Spray

Coconut  
Oil  
Treatment

**AminoSensyl™ HC formulations provide consumer-perceivable benefits on hair**

Textured (4C) hair treated with **AminoSensyl™ HC Intensive Conditioning Bar and Curl Defining Spray** has a smoother and more defined appearance with a tighter curl. Curl Defining Spray eliminates the greasy residue effect that is common with hair treatment oils.



# Split End Repair Cream

Trade Name	Ingredient (INCI)	%(w/w)
Cetyl Alcohol	Cetyl Alcohol	5.00
<b>LexFeel® N5 MB<sup>1</sup></b>	<b>Diheptyl Succinate (and) Capryloyl Glycerin/Sebacic Acid Copolymer</b>	5.00
<b>AminoSensyl™ HC<sup>1</sup></b>	<b>Brassica Alcohol (and) Brassicyl Valinate Esylate</b>	<b>12.50</b>
Coconut Oil <sup>2</sup>	Cocos Nucifera (Coconut) Oil	10.00
Deionized Water	Deionized Water	61.50
Glycerin	Glycerin	5.00
<b>Benzostat™<sup>1</sup></b>	<b>Caprylhydroxamic Acid (and) Benzyl Alcohol (and) Glycerin</b>	1.00
		<b>100.00</b>
<sup>1</sup> INOLEX <sup>2</sup> Anjou		<b>HC-1099</b>

This luxurious cream uses the novel weightless conditioning power of 100% natural and quat-free **AminoSensyl™ HC** to infuse life and shine into dry hair, to repair heat damage, manage fly-aways, and quench split ends.



# Healthy and Nourished Appearance from AminoSensyl™ HC

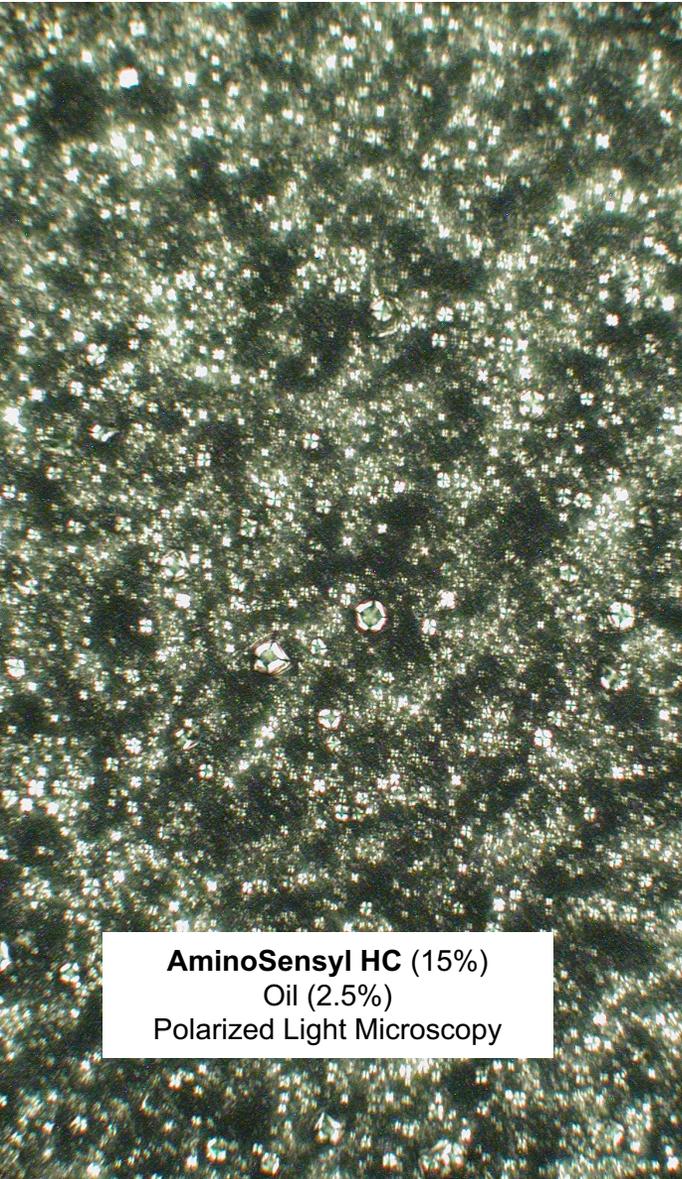


**AminoSensyl™ HC formulations provide consumer-perceivable benefits on hair**

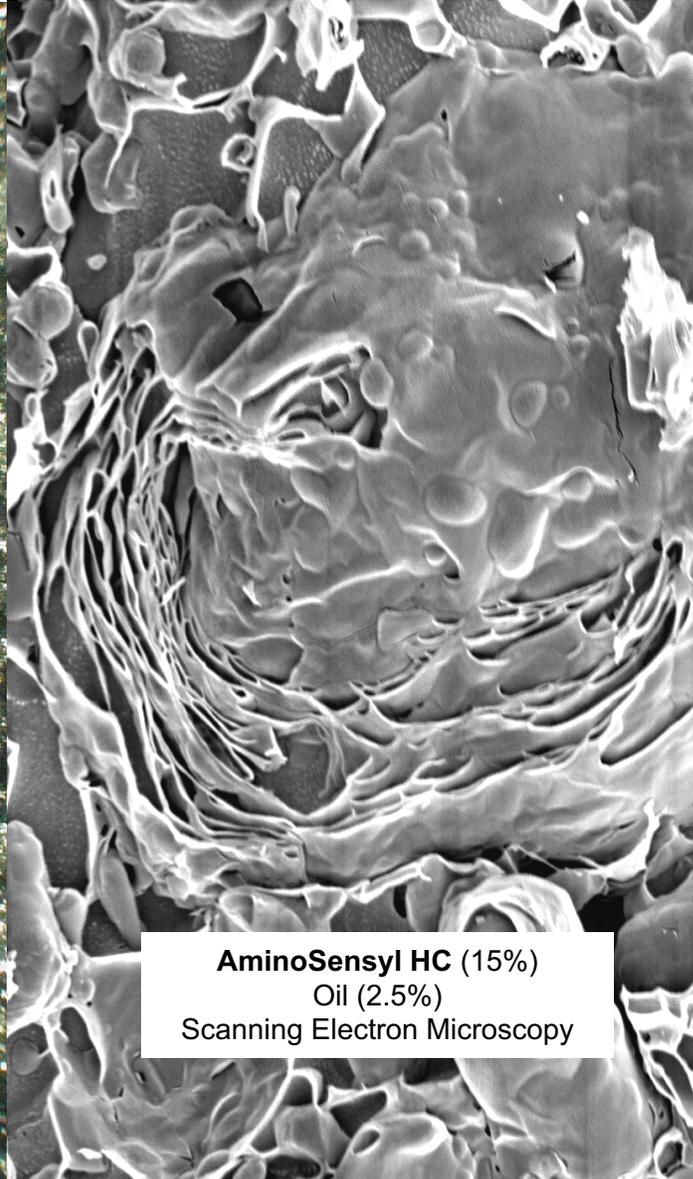
European bleached hair treated with **AminoSensyl™ HC Intensive Conditioning Bar and Split End Repair Cream** has a smooth, moisturized, and healthy appearance.



# AminoSensyl™ HC Formulation Innovation



AminoSensyl HC (15%)  
Oil (2.5%)  
Polarized Light Microscopy



AminoSensyl HC (15%)  
Oil (2.5%)  
Scanning Electron Microscopy

- **Amphiphilic Amino Lipids form lamellar liquid crystals (LLCs)** and vesicles with fatty alcohols
- LLCs allow **high oil loading with a soft, powdery, non-greasy feel**
- **AminoSensyl™ HC** combination of cationic hair care active and Brassica Alcohol is **pre-neutralized** with Calcium Gluconate and **optimized for easy formulation design** and superior formulation performance
- Solid **AminoSensyl™ HC** format is easy to handle with a formulation temperature near 70°C
- **AminoSensyl™ HC** performance is optimized at **pH < 5.0**, the ideal pH range for hair care benefits
- **Innovative formats** are possible
  - **Waterless, sustainable formulations** can be easily formulated and processed
  - **Low viscosity sprayable emulsions** with substantive conditioning



**AminoSensyl™ HC Enables  
Consumer-Desired Claims  
across Market Segments**



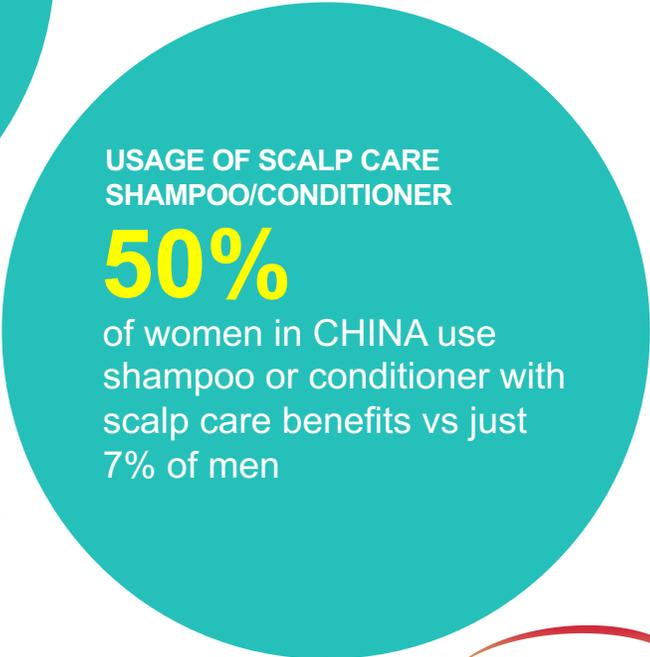
# Global Hair Care Market Craves Diverse Claims



**Hair Care and Performance Claims**



**Ingredient & Safety Claims**



**Scalp Care Claims**

A Year of Innovation in Hair Care, Mintel Report, May 2018



# AminoSensyl™ HC Enables Performance-Based Claims

**9,200**  
Strengthen  
Claims

**10,600**  
Smooth Hair  
Claims

**19,500**  
Hydrating  
Claims

**15,275**  
Damaged Hair  
Claims

## AminoSensyl™ HC Performance & Innovation Claims:

- ✓ Conditions Damaged Hair
- ✓ Smoothing / Anti-Frizz
- ✓ Defined / Sculpted Curls
- ✓ Strengthening / Anti-Breakage
- ✓ Conditions All Hair Types
- ✓ Safe & Gentle on Scalp
- ✓ Patented technology
- ✓ Novel / Innovative Conditioning Active

Mintel GNPD, Global Hair Care Claims 2016-2018



# AminoSensyl™ HC Enables Ingredient & Environmental Claims

**25,800  
Botanical  
Claims**

**Eco-friendly  
claims  
+55%**

**Vegan  
claims  
+115%**

**7,600  
Sulfate-Free  
Claims**

## AminoSensyl™ HC Ingredient & Sustainability Claims:

- ✓ Amino Acid
- ✓ Quat-Free / Non-Quat
- ✓ Sulfate-Free
- ✓ Silicone-Free
- ✓ 100% Natural / 100% Biobased
- ✓ Brassica Derived / Vegetable Family
- ✓ Non-GMO / Gluten Free / Vegan
- ✓ Non-palm source
- ✓ Low energy consumption
- ✓ No chemical waste
- ✓ Solid format – no water shipment
- ✓ Readily biodegradable

Mintel GNPD, Global Hair Care Claims 2016-2018



*The planet is ready for  
100% Natural Quat-Free and  
Biodegradable Conditioning...*

***Are you?***



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HC

