Back to Basics
• Skin Care Market & Consumers

• Back to Basics Trend

• BASF Solutions

• Formulating for Claims
Facial Care is a significant portion, that is powering growth within Skin Care

North America Skin Care Segment & Sub-segment growth

Actual growth 2011-16

Projected growth 2017-2021

Source: Euromonitor.com
Three focus sub-segments driving Face Care market growth

Face Care Market in Retail Value ($ mn)

<table>
<thead>
<tr>
<th>Sub-segment</th>
<th>2016</th>
<th>2021</th>
<th>% CAGR 2016 - 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial Moisturisers</td>
<td>3355.4</td>
<td>3804.9</td>
<td>2.5%</td>
</tr>
<tr>
<td>Anti-Agers</td>
<td>4307.2</td>
<td>4906.9</td>
<td>2.6%</td>
</tr>
<tr>
<td>Others</td>
<td>226.1</td>
<td>347.4</td>
<td>9.0%</td>
</tr>
<tr>
<td>Acne treatment</td>
<td>763.3</td>
<td>836.6</td>
<td>1.9%</td>
</tr>
<tr>
<td>Face mask</td>
<td>1337</td>
<td>1478.5</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

Anti-Agers, Moisturizers, and Masks outpacing other sub-segments and driving overall Face Care growth through 2021

Source: Euromonitor

“Others” – Toners, Lip Care, Men’s post shave
Performance, product benefits and ease of use are the top 3 purchase influencers.

**Purchase Influencers, any rank, by all women 18+ and Millennial women, December 2016**

- Provides good results: 58% (All women), 63% (Millennial women)
- Benefit: 44% (All women), 43% (Millennial women)
- Ease of use: 40% (All women), 43% (Millennial women)
- Product(s) I usually use: 34% (All women), 37% (Millennial women)
- Brand: 29% (All women), 28% (Millennial women)
- Natural ingredients: 23% (All women), 24% (Millennial women)
- Format: 17% (All women), 16% (Millennial women)
- Cruelty free: 16% (All women), 16% (Millennial women)
- Environmentally-friendly: 12% (All women), 9% (Millennial women)
- Interesting package/design: 9% (All women), 9% (Millennial women)
- Ethically-sourced: 7% (All women), 7% (Millennial women)
- Portion of proceeds go to charity: 6% (All women), 4% (Millennial women)
- Other: 2% (All women), 2% (Millennial women)

Base: 1,274 female internet users aged 18+ who perform beauty routines; 586 Millennial female internet users aged 22-39 who perform beauty routines
Source: Lightspeed/Mintel
• Skin Care Market & Consumers
• Back to Basics Trend
• BASF Solutions
• Formulating for Claims
Well known performance ingredients

- **Retinoids** for skin anti-aging
- **Hyaluronic acid** for skin hydration
- **Hydroxy acids** for skin exfoliation
- **Ascorbic acid** for skin anti-aging and brightening
Back to Basics Trend

Key Trends That Will Drive Sales In The Skincare Segment In 2017

**Hyaluronic Acid And Retinoids:** These two ingredients are taking the skincare industry by the storm because of their powerful anti-aging properties.

The Best Retinoid Products—and Why You Should Use Them

**Retinoids:** “There is not a single class of ingredient that can rival the track record that retinoids have for proven scientific results,” says Macrene Alexiades-Armenakas, MD, Ph.D., a New York City based dermatologist.

The Return to Retinol

In fact, it was discovered 81 years ago. For the past few decades, it has been hiding in plain sight—but with a few new developments, it is stepping back into the limelight.

https://www.vogue.com/article/the-return-to-retinol
Skin Aging process

Main Influencers of the aging process

- genetics
- hormonal changes
- Environment - UV radiation, stress
- metabolic processes – oxidation, glycation

All factors together act on the alterations of skin structure, function, and appearance.

Yet, solar UV radiation unquestionably is the single major factor responsible for skin aging

Retinoids in the treatment of skin aging: an overview of clinical efficacy and safety
Addressing skin concerns by Retinoids

Scientifically documented efficacy of Retinoids in skin treatment of UV damage, anti-aging applications, acne, dry skin conditions, barrier improvement
Retinoids used in skin care

Allowed in cosmetic application

- Retinyl Esters
  - More Stable
  - Minimal irritation
  - 0.1 – 5%

- Retinol
  - Moderate Stable
  - Low irritation
  - 0.01 – 1%

- Retinaldehyde
  - Less Stable
  - High irritation
  - 0.05 – 0.1%

- Retinoic acid
  - Moderate Stable
  - High irritation
  - 0.025 – 0.1%

Prescription drug

Retinoids:
- Retinol
- Retinaldehyde
- Retinoic acid

Sources:
- J.Leyden, Cosmetic Dermatology; (18):1, Suppl. 1, (2005) 14-17
- Kang: Cosmetic Dermatology; (18):1, Suppl. 1, (2005) 6-8
• Skin Care Market & Consumers
• Back to Basics Trend
• BASF Solutions
• Formulating for Claims
BASF Technologies

Pure Retinols
- Retinol 10S
- Retinol 10SU
- Retinol 50C

Stabilized Retinol
- RetiSTAR™
- Cylasphere™ Retinol

Botanical Alternatives
- Vit-A-Like™
- Lox-Age™
BASF Retinols

- Retinol 10S
- Retinol 10SU
- Retinol 50C
# BASF Retinol Portfolio

## BASF Retinol Portfolio

<table>
<thead>
<tr>
<th></th>
<th>Retinol 10S</th>
<th>Retinol 10SU</th>
<th>Retinol 50C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INCI</strong></td>
<td>Glycine Soja (Soybean) Oil (and) Retinol</td>
<td>Glycine Soja (Soybean) Oil (and) Retinol</td>
<td>Retinol (and) Polysorbate-20</td>
</tr>
<tr>
<td><strong>IU/g</strong></td>
<td>330,000 - 370,000</td>
<td>330,000 - 370,000</td>
<td>1,425,000 - 1,650,000</td>
</tr>
<tr>
<td><strong>Active Matter</strong></td>
<td>~ 10%</td>
<td>~ 10%</td>
<td>42.75 - 49.5%</td>
</tr>
<tr>
<td><strong>Antioxidant/ Stabilizer</strong></td>
<td>~ 1% BHT</td>
<td>None</td>
<td>~3.5% BHT &amp; ~1% BHA</td>
</tr>
<tr>
<td><strong>Description &amp; Solubility</strong></td>
<td>All-trans-retinol, vitamin A alcohol; Yellow Oil &amp; Soluble in Fats &amp; Oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Regulatory</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCPC</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IECSC</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IECIC 2015</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JP cosmetics</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QD Active</td>
<td></td>
<td></td>
<td>✗</td>
</tr>
</tbody>
</table>

*JP cosmetics QD Active: ✓*
Stability of BASF Retinols

For all 4 grades, more than 85% of Retinol was recovered after storage at 40°C for 12 weeks.

Note: Samples were stored in aluminum lined tubes under inert gas.

Storage stability of Retinol 10S, 15D and 50C was evaluated for 12 weeks at 8°C, 20°C and 40°C. Retinol was quantified using HPLC analysis.
Formulating with Retinol

Retinol is sensitive to

**Oxygen:**

\[
\text{CH}_2\text{OR} \quad \text{CH}_2\text{OR} \quad \text{CH}_2\text{OR} \quad \beta\text{-ionon}
\]

**Heat/Light:**

\[
\text{Isomers} \quad \text{Kitols}
\]

**Acids/Heavy Metals:**

\[
\text{Retrovitamin A} \quad \text{Anhydrovitamin A}
\]

---

**Incorporation**

- Processing below 40°C, storage at or below 25°C
- Common pH range between 5.5 and 8

**Storage Conditions**

- Aluminum-lined tubes, oxygen-impermeable
- Blanket with inert gas during manufacturing and packaging
  - Optional: Work under yellow lighting

**Skin irritation potential**

- Retinol concentration dependent and may need anti-irritants in formula
Stabilized Retinols

- RetiSTAR™
- Cylasphere™ Retinol
# Stabilized Retinol

<table>
<thead>
<tr>
<th>Description</th>
<th>Stabilized Retinol with Vitamins E &amp; C</th>
</tr>
</thead>
<tbody>
<tr>
<td>INCI</td>
<td>Caprylic/Capric Triglyceride (and) Sodium Ascorbate (and) Tocopherol (and) Retinol</td>
</tr>
<tr>
<td>Retinol content</td>
<td>5-5.9*%</td>
</tr>
<tr>
<td>Solubility</td>
<td>All-trans-retinol, vitamin A alcohol</td>
</tr>
<tr>
<td><strong>Regulatory data</strong></td>
<td></td>
</tr>
<tr>
<td>PCPC</td>
<td>✔</td>
</tr>
<tr>
<td>IECSC</td>
<td>✔</td>
</tr>
<tr>
<td>IECIC 2015</td>
<td>✔</td>
</tr>
<tr>
<td>QD Active*</td>
<td>✔</td>
</tr>
</tbody>
</table>

*RetiSTAR™ is a QD active, with registered skin protection, moisturizing, avoid drying, protect skin rough claims traditionally made in QD. Retistar™ is not approved for “anti-wrinkle” claim.
RetiSTAR™

RetiSTAR™ is a combination of Retinol with Sodium Ascorbate and Tocopherol

• This combination renders superior stability against degradation of retinol
• Three vitamins are provided as dispersion in oil
• Sedimentation can be easily reversed by shaking or stirring prior to use
• Eliminates the need to manufacture products under inert conditions
RetiSTAR™ Stability & Formulating

Storage stability of O/W formulations with 0.1% Retinol was evaluated for 12 weeks at 40°C. Retinol was quantified using HPLC analysis.

Incorporation:
- Processing below 30°C and homogenize, storage at low temperatures (5-10°C)
- Common pH range between 5.5 and 8
- Minimal manufacturing constraints

Storage Conditions:
- Aluminum-lined tubes, oxygen-impermeable
- NO inert gas is required

RetiSTAR™ retains >85% retinol with no manufacturing constraints compared to Retinol

Note: Samples were stored in aluminum lined tubes without inert gas.
Powdery-Butter-to-Dry-Oil  
(SC-FR-14-010-A015)

### Procedure
1. Heat phase A at 85°C
2. Introduce B in A and have a high stir during 5 minutes
3. Pour hot (immediately after obtaining an homogenous phase) in the packaging

### Specifications:
**Hardness**
(Penetrometer Petrotest PNR12; conus 18-0131; 10s; 20°C) 39 mm

Additional performance has not been evaluated

### Table: Ingredients

<table>
<thead>
<tr>
<th>Phase</th>
<th>Ingredients</th>
<th>INCI</th>
<th>% wt.</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Lanette® 22</td>
<td>Behenyl Alcohol</td>
<td>5.00</td>
<td>Consistency agent</td>
</tr>
<tr>
<td></td>
<td>Cutina® HR Powder</td>
<td>Hydrogenated Castor Oil</td>
<td>2.00</td>
<td>Structurant</td>
</tr>
<tr>
<td></td>
<td>Celit® SB 45</td>
<td>Bulvyroperum Parkii (Shea) Butter</td>
<td>4.00</td>
<td>Consistency agent</td>
</tr>
<tr>
<td></td>
<td>Cosmedia® Gel CC</td>
<td>Dicapryl Carbonate (and) Stearalkonium Hectorite (and) Propylene Carbonate</td>
<td>15.00</td>
<td>Rheology modifier</td>
</tr>
<tr>
<td></td>
<td>Myritol® 312</td>
<td>Caprylic/Capric Triglyceride</td>
<td>14.00</td>
<td>Emollient</td>
</tr>
<tr>
<td></td>
<td>Celit® Sensoft</td>
<td>Propylheptyl Caprylate</td>
<td>14.00</td>
<td>Emollient</td>
</tr>
<tr>
<td></td>
<td>Celit® RLF</td>
<td>Caprylyl Caprylate/Caprate</td>
<td>14.00</td>
<td>Emollient</td>
</tr>
<tr>
<td></td>
<td>Chion™ M SVA</td>
<td>Synthetic Fluorphlogopite (and) Lauroyl Lysine</td>
<td>10.00</td>
<td>Skin feel modifier</td>
</tr>
<tr>
<td></td>
<td>SunPMMA-S PLUS</td>
<td>Polymethyl Methacrylate</td>
<td>10.00</td>
<td>Skin feel modifier</td>
</tr>
<tr>
<td></td>
<td>Chroma® Lite® Magenta CL4505</td>
<td>Mica (and) Bismuth Oxychloride (and) Carmine</td>
<td>0.10</td>
<td>Effect pigment</td>
</tr>
<tr>
<td>B</td>
<td>Celit® Ultimate</td>
<td>Undecane (and) Tridecane</td>
<td>10.00</td>
<td>Emollient</td>
</tr>
<tr>
<td></td>
<td>RetiSTAR®</td>
<td>Caprylic/Capric Triglyceride, Sodium Ascorbate, Tocopherol, Retinol</td>
<td>1.00</td>
<td>Active ingredient</td>
</tr>
</tbody>
</table>

**Anhydrous**

A delicate butter with a melting effect transforming to a powdery butter that leaves a dry-oily and rich after-feel with an intense powdery skin sensation.

**Featuring RetiSTAR®**
# Stabilized Retinol

<table>
<thead>
<tr>
<th>C00479</th>
<th><strong>Cylasphere™ Retinol</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Encapsulated Retinol</td>
</tr>
<tr>
<td><strong>INCI</strong></td>
<td>Aqua (and) Butylene Glycol (and) Glycine Soya (Soybean) Oil (and) Retinol (and) Pentylene Glycol (and) Carbomer (and) Tocopherol (and) Acacia Senegal Gum (and) Propylene Glycol Alginate</td>
</tr>
<tr>
<td><strong>Retinol content</strong></td>
<td>1.35%</td>
</tr>
<tr>
<td><strong>Solubility</strong></td>
<td>All-trans-retinol, vitamin A alcohol</td>
</tr>
<tr>
<td><strong>Regulatory data</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PCPC</td>
</tr>
<tr>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
Cylasphere™ Retinol - Agar microsphere produced by transacylation to encapsulate fragile retinol

Retinol is released gradually from the microspheres by different skin enzymes

<table>
<thead>
<tr>
<th>Tested enzyme</th>
<th>Cylasphere™ opening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cathepsine D</td>
<td>+</td>
</tr>
<tr>
<td>Cathepsine B</td>
<td>+</td>
</tr>
<tr>
<td>Trypsine</td>
<td>+</td>
</tr>
<tr>
<td>Chymotrypsine</td>
<td>+</td>
</tr>
<tr>
<td>Endoprotease</td>
<td>+</td>
</tr>
<tr>
<td>No specific protease</td>
<td>+</td>
</tr>
<tr>
<td>Thermolysine protease</td>
<td>+++</td>
</tr>
</tbody>
</table>

- No digestion
- Beginning of digestion
- Advanced digestion
- Total digestion
Bioavailability & Formulating with Cylasphere™ Retinol

Franz cell diffusion was used to compare Cylasphere™ Retinol and Retinol in O/W formulations with 1.25% Retinol. Retinol was quantified using HPLC analysis.

Incorporation:
- Processing below 30°C under planetary stirring
- Common pH range between 6 and 7.5

Storage Conditions:
- Aluminum-lined tubes, oxygen-impermeable
- Blanket with nitrogen after de-aeration of formulation

Cylasphere™ Retinol’s slow release of Retinol will lower associated irritations.
Retinol alternatives

- Vit-A-Like™
- Lox-Age™
Vit-A-Like™
Botanical Alternative to Retinol

1. Aqueous extraction
2. Separation

Vigna aconitifolia seeds

Polyphenols

Vit-A-Like™

Drought-resistant

100% renewable
Preservative free
Powder
Origin: India

China
IECIC listed

Approved by ECOCERT
Powder Only
## Botanical Alternative - Vit-A-Like™

<table>
<thead>
<tr>
<th>Description</th>
<th>Vit-A-Like™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extract of Vigna Aconitifolia Seed</td>
<td></td>
</tr>
<tr>
<td>LS9898 - Powder</td>
<td>LS9793 - Liquid</td>
</tr>
<tr>
<td>Vigna Aconitifolia Seed Extract (and) Maltodextrin</td>
<td>Water (and) Vigna Aconitifolia Seed Extract (and) Sodium Cocoyl Glutamate</td>
</tr>
<tr>
<td>Dose of Use</td>
<td>0.021-0.35%</td>
</tr>
<tr>
<td>Aspect</td>
<td>White Powder</td>
</tr>
<tr>
<td>Solubility</td>
<td>Soluble in water, insoluble in oils</td>
</tr>
<tr>
<td>Preservative system</td>
<td>None</td>
</tr>
<tr>
<td>Regulatory data</td>
<td></td>
</tr>
<tr>
<td>PCPC</td>
<td>✓</td>
</tr>
<tr>
<td>IECSC</td>
<td>✓</td>
</tr>
<tr>
<td>IECIC 2015</td>
<td>✓</td>
</tr>
<tr>
<td>QD additive</td>
<td>✗</td>
</tr>
</tbody>
</table>
Vit-A-Like™: Botanical Alternative Retinol

**In vitro/ Ex vivo**

+63% Stimulation of HGF release on dermal fibroblasts without modification of cell no.

+93% Collagen I synthesis on dermal fibroblasts

+29% Collagen synthesis on reconstructed epidermis

**In vivo Results**

**SKIN SURFACE:**

+54% Epidermal turnover

**WRINKLE FADE BOOSTER:**

- 7% Crow’s feet wrinkle volume reduction

D0: before treatment

D56: after 2 months of treatment

*The claims and supporting data provided in this publication have not been evaluated for compliance with any country or other jurisdiction’s regulatory requirements. Therefore, BASF disclaims liability for third party claims or damages arising from recipient’s use of information contained in this publication including, but not limited to, such use in advertising or finished product label claims.*
# Continuous Nighttime Vitality Cream

(Sc-De-12-166-5)

## Specifications:
- **pH (23°C)**: 6.5
- **Viscosity** (Brookfield; DV-I; spindle T-D, helipath; 4 rpm; 23°C): 225,000 mPas
- Additional performance has not been evaluated Parfum (Night Serum)

## Procedure:
1. Heat phase A and B separately to 80°C
2. Add phase B into phase A while stirring. Add phase C below 40°C
3. If necessary adjust the pH-value to pH ~ 6.5
4. Stop stirring at 30°C.

---

<table>
<thead>
<tr>
<th>Phase</th>
<th>Ingredients</th>
<th>INCI</th>
<th>% wt.</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Emulgade® PL 68/50</td>
<td>Cetearyl Glucoside, Cetearyl Alcohol</td>
<td>3.00</td>
<td>Emulsifier (O/W)</td>
</tr>
<tr>
<td></td>
<td>Eumulgin® SG</td>
<td>Sodium Stearyl Glutamate</td>
<td>0.25</td>
<td>Emulsifier (O/W)</td>
</tr>
<tr>
<td></td>
<td>Cutina® PES</td>
<td>Pentaerythritol Distearate</td>
<td>4.00</td>
<td>Consistency agent</td>
</tr>
<tr>
<td></td>
<td>Cegesoft® PS 6</td>
<td>Vegetable Oil</td>
<td>4.00</td>
<td>Emollient</td>
</tr>
<tr>
<td></td>
<td>Cetiol® RLF</td>
<td>Caprylyl Caprylate/Caprate</td>
<td>5.00</td>
<td>Emollient</td>
</tr>
<tr>
<td></td>
<td>Myritol® 312</td>
<td>Caprylic/Capric Triglyceride</td>
<td>5.00</td>
<td>Emollient</td>
</tr>
<tr>
<td></td>
<td>Cetiol® SS 45</td>
<td>Butyrospermum Parkii (Shea) Butter</td>
<td>2.50</td>
<td>Emollient</td>
</tr>
<tr>
<td></td>
<td>Cetiol® MM</td>
<td>Myristyl Myristate</td>
<td>2.50</td>
<td>Emollient</td>
</tr>
<tr>
<td></td>
<td>Cosmedia® DC</td>
<td>Hydrogenated Dimer Dilinoleyl/Dimethylcarbonate Copolymer</td>
<td>1.00</td>
<td>Skin feel modifier</td>
</tr>
<tr>
<td></td>
<td>Dry-Flo Plus (Akzo Nobel®)</td>
<td>Aluminum Starch Octenylsuccinate</td>
<td>1.50</td>
<td>Skin feel modifier</td>
</tr>
<tr>
<td>B</td>
<td>Water, demin.</td>
<td>Water</td>
<td>62.45</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Glycerin</td>
<td>Glycerin</td>
<td>2.00</td>
<td>Humectant</td>
</tr>
<tr>
<td></td>
<td>Butylene Glycol</td>
<td>Butylene Glycol</td>
<td>2.00</td>
<td>Humectant</td>
</tr>
<tr>
<td></td>
<td>Protectol® PE</td>
<td>Phenoxyethanol</td>
<td>1.00</td>
<td>Preservative</td>
</tr>
<tr>
<td>C</td>
<td>Cylasphere™ Retinol C00479</td>
<td>Aqua, Butylene Glycol, Glycine Soya (Soybean) Oil, Retinol, Pentylene Glycol, Carbomer, Tocopherol, Acacia Senegal Gum, Propylene Glycol Alginate</td>
<td>0.50</td>
<td>Active ingredient</td>
</tr>
<tr>
<td></td>
<td>Vit-A-Like™ LS 9793</td>
<td>Water, Vigna Aconitifolia Seed Extract, Sodium Cocoyl Glutamate</td>
<td>3.00</td>
<td>Active ingredient</td>
</tr>
<tr>
<td></td>
<td>Perfume*</td>
<td>Fragrance</td>
<td>0.30</td>
<td>Fragrance</td>
</tr>
<tr>
<td>D</td>
<td>Citric Acid (20% solution)</td>
<td>Citric Acid</td>
<td>q.s.</td>
<td>pH Adjustment</td>
</tr>
<tr>
<td></td>
<td>Preservative</td>
<td></td>
<td>q.s.</td>
<td>Preservative</td>
</tr>
</tbody>
</table>

---

Featuring Vit-A-Like™ & Cylasphere™ Retinol

---

We create chemistry
Lox-Age™
The Skin Surface Protector

Cichorium Intybus Leaf

Aqueous extraction

Phenylpropanoid

Preservative free

Origin: France

China IECIC listed
## Retinol Alternative

<table>
<thead>
<tr>
<th><strong>Lox-Age™</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Aqueous extract of chicory leaves</td>
</tr>
<tr>
<td><strong>INCI</strong></td>
<td>Water (and) Cichorium Intybus (Chicory) Leaf Extract (and) Hexylene Glycol (and) Caprylyl Glycol (and) Xanthan Gum</td>
</tr>
<tr>
<td><strong>Reference</strong></td>
<td>A00327</td>
</tr>
<tr>
<td><strong>Dose of Use</strong></td>
<td>2%</td>
</tr>
<tr>
<td><strong>Aspect</strong></td>
<td>Amber liquid</td>
</tr>
<tr>
<td><strong>Solubility</strong></td>
<td>Soluble in water, insoluble in oils</td>
</tr>
<tr>
<td><strong>Preservative system</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Regulatory data</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>PCPC</strong></td>
</tr>
<tr>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
Lox-Age™: Results

**In vitro/Ex vivo**

- **+100%** LOX mRNA express
- **+70%** LOX protein synthesis
- **+22%** COL1 synthesis
- **+172%** COL1 fibers networks organization

**In vivo**

**SKIN SURFACE:**

- **+62%** Skin roughness improvement
- **+25%** Pore reduction
- **+19%** Skin smoothness

**WRINKLE FADE BOOSTER:**

- **+24%** Deep wrinkle improvement vs baseline

**Self assessment**

- The skin appears younger
- The product has a nourishing effect
- The skin appears more radiant
- The skin is more moisturized
- The skin is more elastic
- The wrinkles and fine lines of the crow’s feet seem decreased

Self-assessment of efficacy of tested products:

- LOX-AGE™ at 2%
- Retinol at 0.07%
Skin Care Market & Consumers

Back to Basics Trend

BASF Solutions

Formulating for Claims
Retinol Rush

• 0.01% Retinol and above: improving multiple signs of aging and overall skin health and minimizing pore size

• 0.04% Retinol and above: improve visible signs of environmental assault and the appearance of thinning skin.

• 0.1% Retinol and above: improve multiple signs of aging in 8 weeks (2009 study)

• 0.5%-1% Retinol: for dramatic, rapid results for skin anti-aging, wrinkles and finelines

• 2% Retinol: Overnight resurface claim (high concentration of retinol – not recommended normally)

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### Formulating for claims

<table>
<thead>
<tr>
<th>Pure Retinol</th>
<th>Retinol 50C (50% Retinol)</th>
<th>Retinol 10S &amp; 10SU (10%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Achieve final Retinol conc in formula ≤ 2%</td>
<td>• Achieve final Retinol conc in formula ≤ 0.2%</td>
</tr>
<tr>
<td></td>
<td>• manufacturing and packaging restrictions</td>
<td>• manufacturing and packaging restrictions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stabilized Retinol</th>
<th>RetiSTAR™ (5% Retinol)</th>
<th>Cylasphere™ Retinol (1.35% Retinol)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Achieve final Retinol conc in formula ≤ 0.1%</td>
<td>• Reduce risk of skin irritation</td>
</tr>
<tr>
<td></td>
<td>• with packaging constraints</td>
<td>• Achieve final Retinol conc in formula ≤ 0.02%</td>
</tr>
<tr>
<td></td>
<td>• no manufacturing restriction</td>
<td>• manufacturing and packaging restrictions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Retinol Alternative</th>
<th>LOXAGE™ &amp; Vit-A-like™</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Botanical alternative to retinol</td>
</tr>
<tr>
<td></td>
<td>• stable</td>
</tr>
<tr>
<td></td>
<td>• no manufacturing or packaging concerns</td>
</tr>
</tbody>
</table>
RETINOIDS
Potential efficacy & packaging claims *

Pore cleansing and tightening

wrinkles and fine lines

Stop the clock

Rough texture

Skin renewal

Acne Treatment

Blackhead Treatment

A remarkably smoother appearance

A noticeable feeling of firmness

even tone

Healthier-looking skin

Reverse time

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Retinoid trend and best solution
Launch and Promotion

**Pure Retinols**
- Retinol 10S
- Retinol 10SU
- Retinol 50C

**Stabilized Retinol**
- RetiSTAR™
- Cylasphere™ Retinol

**Botanical Alternatives**
- Vt-A-Like™
- Lox-Age™

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**Product information**
- Product finder
- UL prospector
- World account

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**Demonstration**
Science Powered Efficacy
Safety & Efficacy

**Natural**

**Industry Magazine promotions**

**Recorded Webinar**

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