ProCutiGen® Vegan Thermal Shield
Thermal Protection + Preventative Hair Care + Support

Tomorrow’s Vision... Today!®
ProCutiGen®  Vegan Thermal Shield

Technical Information

**Product Code:** 20830

**INCI Name:** Saccharomyces Cerevisiae Extract

**INCI Status:** Conforms

**Suggested Use Level:** 1.0-10.0%

**Suggested Applications:** Thermal Protection, Nourishing
The “Plex Phenomenon” has swept the global haircare industry with products focused on bond multiplying or re-bonding

- 525% increase in sales of bond multipliers between 2014 and 2015\(^1\)

Current market is saturated with products claiming to re-bond the hair

- Olaplex, L’Oréal Professional Smartbond, Bond Angel by Nutree Professional, Redken pH Bonder, Brazilian Bond Builder, etc.

Active Concepts is shifting the focus to proactively protect the hair shaft through “ProBonding”

ProCutiGen® Vegan Thermal Shield is an incredible scientific breakthrough that shakes the foundations of how we consider preventative hair care – repair beyond the bond.

\(^1\)Kline and Company. Salon Hair Care Global Series. 2016.
Our ProCutiGen® line of hair actives consists of bivalent cationic peptides that self assemble and effectively staple a unique film on to the hair cuticle.

- The natural anionic charge of the hair attracts the cationic peptides.

- The amino acid sequence of the naturally derived peptides dictates the nature of the film on the hair.

- ProCutiGen® Vegan Thermal Shield is yeast derived.
  - Active Concepts has designed the yeast to mimic the natural amino acid composition of keratin!

Keratin = Strength and Protection.
ProCutigen®  Vegan Thermal Shield

ProBonding Technology

• Cuticle preservation is essential to prevent hair damage

• Damage to the cuticle compromises the structural integrity of the hair shaft, making hair prone to breakage

• Utilizing the concept of synthetic biology, ProCutigen®  Vegan Thermal Shield is a bivalent cationic lipopeptide that self-assembles into a neo-cuticle on the hair

• The formation of this biomimetic cuticle helps to retain style while offering protection from harsh styling treatments to promote healthy hair

Damaged Cuticle  Healthy Cuticle
Thermal damage can strip moisture from the hair
- Cracked cuticles
- Brittle, dry appearance

Hair needs a solid foundation to prevent damage
- Building block of hair is keratin!

Keratin makes up more than 90% of the hair follicle and is a source of strength and flexibility

Keratin is rich in cysteine, a sulfur-containing amino acid that gives the protein its unique strength and protective quality
When hair undergoes heat styling or chemical processing, cysteine bridges are broken
- Hair is left in a damaged, weakened state

**ProCutiGen® Vegan Thermal Shield** is a lipopeptide derived from yeast, harnessing the natural strength of keratin for hair protection!

- Active Concepts has designed the yeast to mimic the natural amino acid composition of keratin
ProCutigen® Vegan Thermal Shield

Benefits

✓ Thermal Protection
✓ Protects Hair
✓ Strengthens Hair
✓ Great for All Hair Types

Proactive. Protection. ProBonding.
Thermal Protection Assay

- Quantitative measurements in the amount of protein removed from hair during heat styling can serve as a method to assess hair damage.

- Hair protein extraction, Bradford protein analysis, and protein gel electrophoresis were performed to assess the ability of ProCutiGen® Vegan Thermal Shield to protect hair from heat styling damage.

- The application of 2.0% ProCutiGen® Vegan Thermal Shield to both virgin and bleached hair followed by flat ironing helped to decrease the amount of protein lost, indicating that ProCutiGen® Vegan Thermal Shield is capable of preventing thermal damage.
Results

- The results demonstrate an increase in extractable protein obtained through bleaching and heat treatment.
- 2.0% ProCutiGen® Vegan Thermal Shield to both virgin and bleached hair followed by flat ironing helped to decrease the amount of protein lost.
- 2.0% ProCutiGen® Vegan Thermal Shield to virgin hair retained 60.9% more protein concentration during heat styling compared to water alone.
- For bleached hair, the application of 2.0% ProCutiGen® Vegan Thermal Shield allowed the hair to retain 65.4% more protein, when compared to water alone.

**Figure 1.** Concentration of extractable protein for each hair sample.
ProCutiGen® Vegan Thermal Shield

Thermal Protection Assay

Comparative Protein Retention

Results

• The results demonstrate an increase in extractable protein obtained through bleaching and heat treatment

• 2.0% ProCutiGen® Vegan Thermal Shield to both virgin and bleached hair followed by flat ironing helped to decrease the amount of protein lost

• 2.0% ProCutiGen® Vegan Thermal Shield to virgin hair retained 60.9% more protein concentration during heat styling compared to water alone

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Figure 2. Comparative protein retention.
Thermal Protection Assay

Protein Gel Electrophoresis

Results

• In Figure 3, the bleached hair samples in lanes 2, 4, and 6, exhibit an increased dye density.

• This increased dye density correlates a higher amount of protein loss and consequential damage.

• In hair samples with less damage, such as the virgin hair samples in lanes 1, 3, and 5, the hair follicle is less porous and releases a lower concentration of protein.

Figure 3. Protein gel electrophoresis of hair samples.
ProCutiGen® Vegan Thermal Shield

Scanning Electron Microscopy

<table>
<thead>
<tr>
<th>Swatch</th>
<th>SEM Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated Virgin Hair</td>
<td><img src="image1.png" alt="SEM Image" /></td>
</tr>
<tr>
<td>Water Treated + Blown Dry &amp; Flat Ironed</td>
<td><img src="image2.png" alt="SEM Image" /></td>
</tr>
<tr>
<td>2.0% ProCutiGen® Vegan Thermal Shield + Blown Dry &amp; Flat Ironed</td>
<td><img src="image3.png" alt="SEM Image" /></td>
</tr>
</tbody>
</table>

Results

- SEM images illustrate treating hair with ProCutiGen® Vegan Thermal Shield makes a difference at the microscopic level.
- In the curled hair the cuticle is clearly damaged.
- ProCutiGen® Vegan Thermal Shield shields each fiber and protects cuticle.
- Depicts the ability of ProCutiGen® Vegan Thermal Shield to protect hair from damage associated with styling.

Figure 4. SEM Images.
ProCutigen® Vegan Thermal Shield

HIROX 3D Imaging

- Damage of the hair fiber can be seen within the following images in which the damaged areas of the fiber fluoresce
- Greater fluorescence corresponds to greater damage
- HIROX images were quantified via histograms
- HIROX Images were taken of curled hair
- Significantly less damage when using ProCutigen® Vegan Thermal Shield
- The ProCutigen® Vegan Thermal Shield treated fibers are more comparable to the untreated virgin fiber, showcasing ProCutigen® Vegan Thermal Shield’s ability to protect the hair fiber reducing overall damage to the hair
ProCutigens® Vegan Thermal Shield

HIROX 3D Imaging

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<td><img src="image3.png" alt="Image" /></td>
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Figure 5. HIROX results for thermal styled hair.
ProCutiGen® Vegan Thermal Shield

Product Recap

• ProCutiGen® Vegan Thermal Shield offers protection from heat styling and other thermal treatments to promote healthy hair cuticles
  • Creates a biomimetic cuticle on the hair
  • Protects hair
  • Prevents thermal damage

• ProCutiGen® Vegan Thermal Shield is an ideal ingredient for use in a wide range of hair care applications to protect hair against weakening after exposure to thermal processes

Shaking the Foundations of Preventative Hair Care.
Repair Beyond the Bond.
**ProCutiGen® Vegan Thermal Shield**

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THANK YOU
For more information – Visit our website!
www.activeconceptsllc.com