

## Product Information

# Natrulon® RC-100

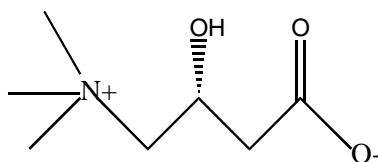
## Reparative / Exfoliant

Lonza, a worldwide leader in life sciences, has developed a new approach to skin reparatives / exfoliants. Based on a patented biotransformation process that produces the highest quality L- Carnitine produced in the world today, the Natrulon® R series of reparatives brings to the formulator a new and novel approach to exfoliation.

Natrulon® RC-100 is 100% L-Carnitine. This white crystalline powder, highly hygroscopic and amino acid-like material brings not only the exfoliation properties expected of a  $\beta$  hydroxy acid but also, due to quaternary functionality, the additional benefit of a high level of moisturization capability.

Thus in keeping with our “No Limits” approach to Personal Care, we are proud to bring to the cosmetics marketplace this natural, endogenous and multifunctional approach to achieving skin exfoliation and reparative effects

### 1. Active matter



L- Carnitine

L- Carnitine is a  $\beta$  - Hydroxyacid when pH Adjusted

- Pure White Crystalline Solid
- Hygroscopic
- Amino acid-like
- Naturally Obtained (Made Via Biotransformation)
- Endogenous to Human Body
- 100% in the “L” Form

Formula C7H15NO3

Molecular Weight 161.20

- |                 |           |
|-----------------|-----------|
| 1.1 CAS N°:     | 541-15-1  |
| 1.2 EINECS N° : | 208-768-0 |
| 1.3 INCI Name : | Carnitine |

### 2. Typical Chemical Composition (%)

L-Carnitine >99%

### 3. Specifications

Appearance	Crystalline Powder
L-Carnitine	99.0 – 101.0 % (w/w)
Specific rotation	-32.0 - -30.0°
Total aerobic microbial count	max 50 CFU/g
pH – value	6.5- 8.5 (2.5g/50 ml)

### 4. Efficacy / Suggested Applications

#### 4.1 Epidermal turnover rate of human skin

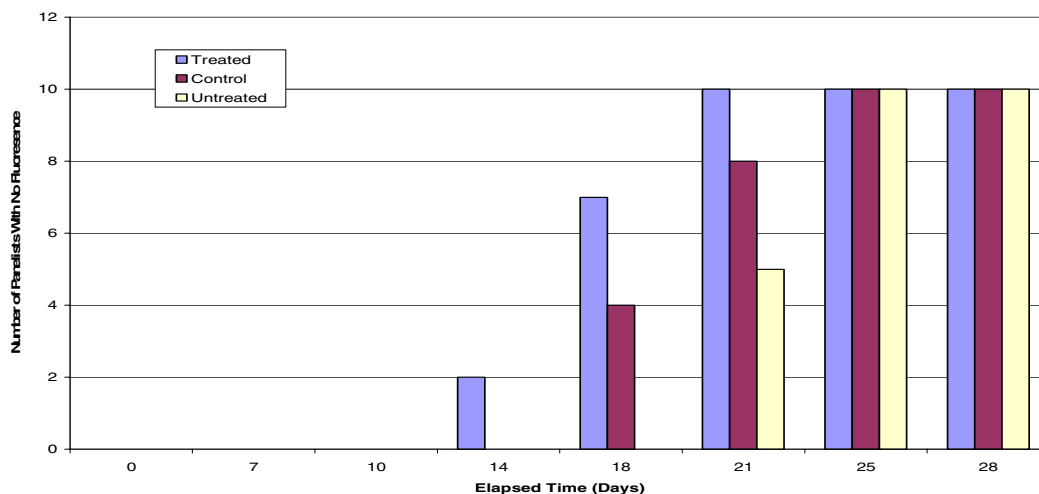
L-Carnitine, a  $\beta$  hydroxyacid exhibits excellent skin exfoliating properties, and at low levels. This exfoliating effect manifests itself as acceleration in epidermal turnover rate.

In healthy skin, the outer most cells in the horny layer are constantly being sloughed off and replaced by new cells generated in the basal layer of the epidermis. The time needed by a new generation of cells to travel from the basal to the upper horny layer represents the renewal time of the epidermis. When the equilibrium of the skin is altered, dead cells tend to accumulate in the outer layers, the turnover rate declines and the renewal time increases. As we age, the time required for skin renewal also increases. In young and middle aged adults the renewal time is approximately 20 days, whereas in adults over 50 the rate of turnover slows and the renewal time increases to approximately 30 days. Typically removal of the dead skin cells and increasing the rate of skin turnover has the result of leaving the skin looking younger and healthier.

The rate of skin turnover is typically determined by the time that it takes for skin treated with a fluorescing dye (dansyl chloride) to lose its ability to fluoresce. In-vivo determination of turnover time in which dansyl chloride was applied to the forearms of human volunteers followed by a topical treatment with either a placebo (cream vehicle) or a cream containing 2% L-Carnitine (over a 28 day duration), clearly shows that application of L-Carnitine does indeed accelerate skin turnover. In contrast to other exfoliating hydroxy acids which work best at pH 3.5 - 4.0, L-carnitine enhances cell turnover at pH 6 – 7. This provides cell turnover benefits at a pH more compatible with skin.

**Figure 1**

**Skin Renewal Time**



The ability of exfoliating hydroxyacids such as glycolic and lactic acids to accelerate the turnover rate of skin cells and to leave the skin looking younger and healthier is well known. Hydroxyacids have their maximum exfoliating effect at low pH, and it is for this reason that exfoliating creams and lotions are typically found to be at a pH between 3.5 and 4.5. However, in contrast to the hydroxyacids typically used for exfoliation (e.g. lactic, glycolic and salicylic), L- Carnitine actually exfoliates better at a pH closer to 7 than it does at a lower pH. This in all likelihood is due to the zwitterionic nature of the compound. Thus L- carnitine exfoliates at a pH more compatible with skin.

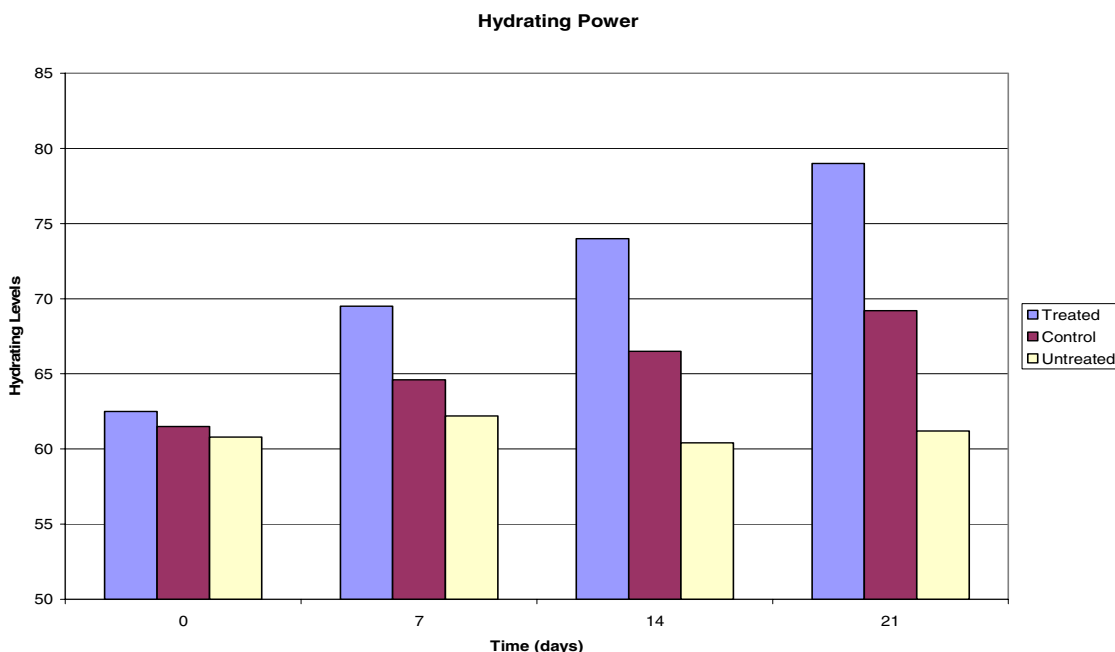
## L-Carnitine benefits vs D-Carnitine

During classical chemical synthesis of Carnitine, both isomers are produced in equal proportions. Whereas L-Carnitine is the naturally occurring and biologically active form that is present in nature and in our bodies, D-Carnitine does not exist in nature and is harmful to the human body. D-Carnitine competes with the L-isomer for the same uptake mechanisms and inhibits the utilization of L-Carnitine. D-Carnitine is not simply an inefficient or biologically inert substance, but rather a deleterious and potentially toxic impurity. The Lonza patented production method of L-Carnitine guarantees production of 100% pure L- Carnitine.

### 4.3 Hydrating power on human skin

Being hygroscopic, L- Carnitine has the ability, even at low levels to hydrate the skin leaving it soft, smooth and moisturized. A human panel test was carried out in which sites on the forearms of the panelists were either untreated, treated daily with a placebo formulation, or treated daily with a formulation containing 2% L-Carnitine. Corneometer readings of the sites were then taken to determine the hydration levels of each site. The data shown in Figure 4 clearly demonstrate the hydrating power of L-Carnitine in cosmetic formulations at pH 7.0.

**Figure 2**



## 4.4 Features/Benefits

<u>Feature</u>	<u>Benefit</u>	<u>What It Means for You</u>
100% L-Carnitine	High Purity	Excellent Safety Profile
Naturally Derived	Formulation Options	Strong Customer Appeal
$\beta$ Hydroxy Acid	Exfoliation	Reduced Presence of AHAs
Hygroscopic	Moisturization	Multifunctionality

## 5. Use areas and recommendations to formulate

Natrulon® RC-100 is suggested for use in skin care applications wherever an exfoliant effect is desired, i.e. in skin reparative or exfoliant formulations. In exfoliating/reparative formulations, effective use levels range from approximately 1% to 5% of Natrulon RC-100 as active. Natrulon® RC-100 is compatible with  $\alpha$  hydroxy acids such as glycolic and lactic acids and can be used in combination with these ingredients or as an equal active replacement for some or all of these materials. Natrulon® RC-100 can also be used in skin lightening applications to improve the efficacy of such formulations. Use levels in the lightener application area are typically in the 2 to 4 % range. Used in cosmetic applications primarily as an exfoliating agent, the hydrating effect of Natrulon® RC-100 can be realized at levels as low as 1% in moisturizing creams and lotions, although higher levels (2 to 4%) will give increased effectiveness.

Natrulon® RC-100 has also been used for its cellulite reduction effect

## 6. Analytical procedure

Available upon request.

Contact Lonza Technical Service – 800-365-8324 in the USA

Contact Lonza Technical Service – + 4161316 8435 in Europe

## 7. Packaging / Storage

The product is supplied in 25Kg (55Lb) or 100kg (220Lb) net weight fiber drums.

Natrulon® RC-100 can be stored for at least two years in the sealed original packaging under normal temperature conditions.

To maintain product quality, do not store in heat or direct sunlight.

## 8. Regulatory information

Refer to the MSDS.

## 9. Toxicological information

Refer to the MSDS.

When creams containing L- Carnitine were applied to the backs of human volunteers under occlusive conditions, even after 24 hours, no erythema or edema was observed. Accordingly, Lonza high purity L- Carnitine was considered to be a non-irritant.

## 10. Ecological and Ecotoxicological Information

Refer to the MSDS

## 11. NAFTA Contact Information

For questions or further information, email Technical Sales Support at [contact.allendale@lonza.com](mailto:contact.allendale@lonza.com), or visit the Lonza web site at [www.lonza.com](http://www.lonza.com). In North America you can call 800 -365 -8324 and from any where else +41 61 316 8111.

## 12. Country of Origin:

Natrulon RC-100 is produced in Switzerland.

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Supercedes 5-21-09

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