SD SUGAR CRYSTAL LC

TECHNICAL DATA SHEET

100% of Natural Liquid Crystal Emulsifier
Total Skin Care Effect by Multi-lamellar Structure
No Irritation and No Animal Sources
High Content of Bound Water System

DESCRIPTIONS
SUGAR CRYSTAL-LC is a 100% botanical natural emulsifier having multifunctional activity without any active ingredients. SUGAR CRYSTAL-LC is an exclusive blend used to create advanced liquid lamellar crystal structure systems. SUGAR CRYSTAL-LC forms a multi-layer liquid crystal structure that mimics the skin, consisting of similar components (sucrose diester surfactant, hydrogenated lecithin, fatty alcohols, triglycerides, etc.) including 15–37% bound water. Unlike typical liquid crystal systems, SUGAR CRYSTAL-LC forms a thick wall around oil droplets improving stability and delivery.

APPLICATIONS
SYSTEMS: 100% Natural Liquid Crystal System (EO-free emulsifier)
FORMULAS: Very stable low viscous lotions, creams, body lotion, hand cream, eye cream etc.
MAKE-UP: BB/CC Cream, Foundations
SUNSCREENS: Emulsifier for Physical and Chemical Sunscreens

WHAT IS SD SUGAR CRYSTAL LC?
SD Sugar Crystal LC is a 100% Natural emulsifier having high functional actions having very safety, sweet flavor. SUGAR CRYSTAL-LC is a proprietary blend of oil, phospholipids and fatty acids. This unique blend creates a beautiful liquid crystal structure as seen below. You can see that all droplets were certified with Maltese cross images (below picture: left). We certified that all droplets are liquid crystals measuring by polarized microscopic analysis as below picture right side.

Liquid crystal droplets  Linear multi-lamellar structures
CERTIFICATIONS OF SUGAR CRYSTAL LC

**Certification of LC with Polarized Microscopy**

**Usage:** Sugar Crystal LC 4%

**Technology Approaches**

**Bound Water Activity**
SUGAR CRYSTAL LC has good effectiveness of more than 7 times compared with conventional o/w emulsion.

**Hydration Effect**
SUGAR CRYSTAL LC has good moisturizing effect for long-lasting compared with conventional o/w emulsion.

**Formulation Guidelines**

**100% Natural Liquid Crystal Emulsifier**

Recommended Use Level: 2.00~4.00%
(SUGAR CRYSTAL LC is a sole emulsifier and does not require additional co-emulsifiers)

- **Solubility:** Oil Soluble
- **pH:** 3.0 - 11.0
- **Viscosity:** Increase percentage of SUGAR CRYSTAL LC to increase viscosity
  - Increase percentage of Oil Phase to increase viscosity
- **Thickeners:** Add Polymeric thickeners (ex. Carbomers)
  - Increase percentage of other waxes and fatty alcohols
- **Oil Phase:** SUGAR CRYSTAL LC emulsions (tested at 3-4%) can hold up to 40% oil phase.
  - Can hold up to 20% silicone (in oil phase)
**SD SUGAR CRYSTAL LC**

**ANALYSIS OF MULTI-LAMELLAR STRUCTURE**

Certification of Lamellar Structure Measured by X-ray Analysis

![Graph showing lamellar structure measurements](image)

The cream used to 4% SUGAR CRYSTAL LC were certified to lamellar structure measured by small angled x-ray through Bregg equation as follow.

Bregg equ \((L_\alpha)\) : 1:1 / 2:1 / 3

**pH EFFECT**

As you can see as below polarized microscopic analysis, various formulations applied SUGAR CRYSTAL LC, Large range were good stabilized from pH= 4.0 to 10.0.

![Microscopic images at different pH levels](image)

**PHYSICAL PROPERTY**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Yellowish wax</td>
</tr>
<tr>
<td>Melting Point</td>
<td>42 – 60°C (Method 1, 1g)</td>
</tr>
<tr>
<td>Acid Value</td>
<td>Max. 5 (Method 2)</td>
</tr>
<tr>
<td>Heavy metal</td>
<td>Max. 20ppm</td>
</tr>
<tr>
<td>Arsenic</td>
<td>Max. 2ppm</td>
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</tbody>
</table>

**LEGISLATION**

- INCI Name: Sucrose Distearate, Glyceryl Stearate, Cetearyl Alcohol, Behenyl Alcohol, Hydrogenated Lecithin, Squalane, Ceramide 3.
- Global Compliance: US, JAPAN, CHINA, KOREA, EU, Global standard