DS-HydroCeramide50, DS-HydroCeramide50S

- Water dispersible natural Ceramide NP
- Easy to use to produce Skin care & Hair care products
- No re-crystallization with high solubility in water
- Developed with SLP technology (Doosan's advanced Solid Lipid Particulation)
- No preservative & No use of organic solvent

1st Winner of BSB Innovation Awards

Product Identification

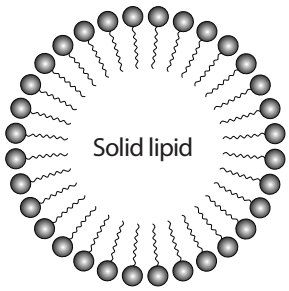
Trade Name	DS-HydroCeramide50	DS-HydroCeramide50S
Appearance	White to pale yellowish powder	
INCI name	CERAMIDE NP (CERAMIDE 3), Hydrogenated Lecithin, Sucrose Stearate, Polyglyceryl- 10 Stearate	
Active Ingredient	Ceramide NP (retired. Ceramide 3)	
- Contents	m.t. 47% by HPLC	m.t. 45% by HPLC
- Ceramide origin	Yeast fermentation	Yeast fermentation

Produced by SLP (Solid Lipid particulation) technology

Developed with SLP technology (Doosan's advanced Solid Lipid Particulation), Doosan suggests DS-HydroCeramide50/50S as the best solution to overcome the limitation in using conventional Ceramide and it offers the below benefits:

Solid Lipid Particle

- No leakage of active material due to solid matrix
- Stable against particle growth
- Stable during storage
- Can be easily used in various cosmetic applications



Product Efficacies

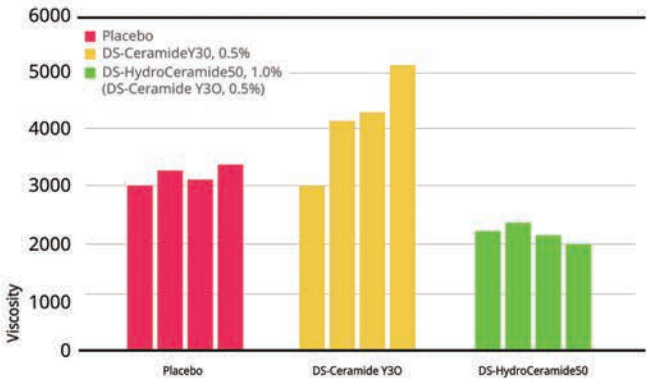
Improvement of solubility

Solvent		Solubility 0.5%	1.5%	2.5%	5%
Polyol / Oil	Polyol / Oil	+	+	-	-
	Glycerin	+	+	-	-
	Caprylic/capric triglyceride	+	+	-	-
Water	Water	++	++	++	++

Physical property such as poor solubility of Ceramide NP causes narrow spectrum of solvent.
DS-HydroCeramide50 is very soluble in water (Red box).

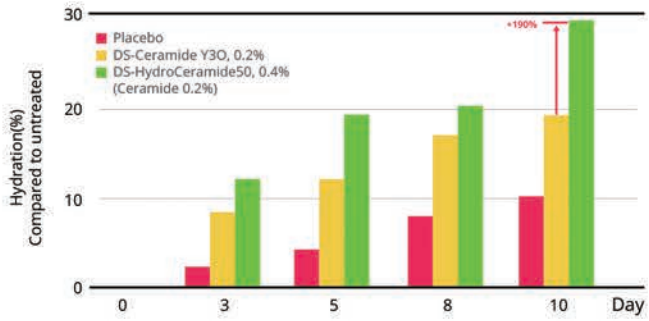
(-) : Non-soluble
(+) : Soluble (Re-crystallization occurs after cooling to RT)
(++) : Very soluble (Re-crystallization does not occur after cooling to RT)

Comparative between Ceramide and HydroCeramide

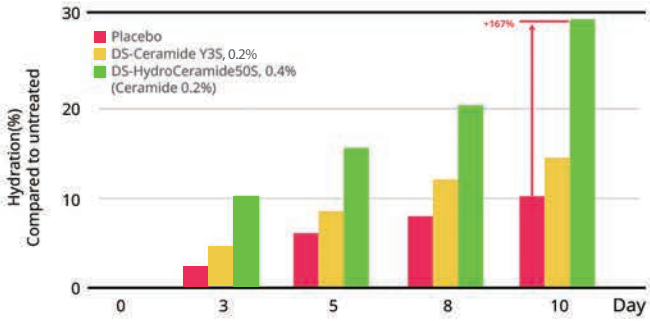


The viscosity of formula containing Ceramide NP increased by re-crystallization phenomenon. There is no significant increase in viscosity of formula including DS-HydroCeramide50. Gelation phenomena which is one of the problems in application of conventional Ceramide NP, also was diminished noticeably.
- Measured at zero, 1, 2, 11 month later

Higher retention of moisture content within skin



- In vivo test : 17 subjects
- Type : DS-Ceramide Y3O/HydroCeramide50
- Measured : Skin hydration by Corneometer

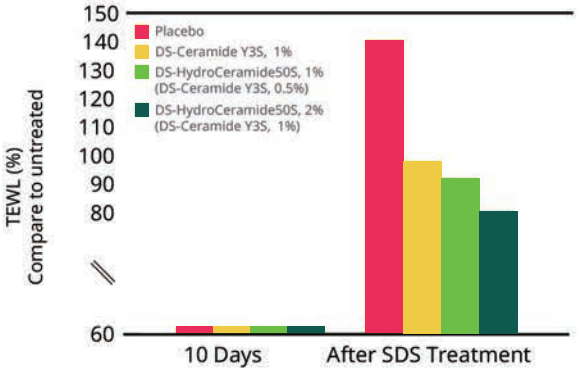


- In vivo test : 17 subjects
- Type : DS-Ceramide Y3S/HydroCeramide50S
- Measured : Skin hydration by Corneometer

Formulations were applied on the forearms, keeping one area untreated. DS-Ceramide Y3O and DS-Ceramide Y3S are added in formulations and corresponding DS-HydroCeramide50 and DS-HydroCeramide50S were also put double to set same active quantity in those formula.

(*Left*)The water retention capacity of skin treated with DS-HydroCeramide50 was improved by 190% and 56% when compared to those treated with Placebo and Ceramide NP (0.2%, DS-Ceramide Y3O) at day 10, respectively.
(*Right*) The water retention capacity of skin treated with DS-HydroCeramide50S was improved by 167% and 99% when compared to those treated with Placebo and Ceramide NP (0.2%, DS-Ceramide Y3S) at day 10, respectively.

Higher reinforcement effect on Skin barrier

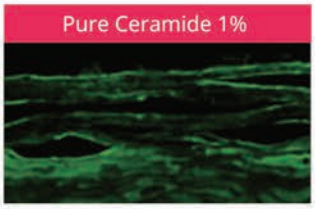


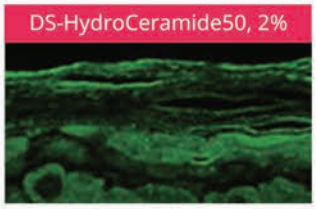
- In vivo test : 17 subjects
- Type : DS-Ceramide Y3S / HydroCeramide50S
  - 0.5% & 1.0% based on pure Ceramide NP
- Application : Twice/day for 10 days
- Measured : Skin hydration by Corneometer

Formulations were applied on the forearms of volunteers twice/day for 10 days. Measurements were evaluated before SDS Sodium Dodecyl Sulphate appication(baseline) and 1 hour after the SDS treatment. The SDS treatment areas were exposed to a 10% aqueous solution for 2 hours to induce skin irritation.

The TEWL of skin treated with DS-HydroCeramide50S (2%) was improved by 41% and 17% when compared to those treated with Placebo and Ceramide NP (1%) at day 10, repectively.

Penetration of DS-HydroCeramide in Human skin





· Emulsion containing DS-HydroCeramide50 showed a higher intensity through stratum corneum when compared to pure ceramide. (Green colored intensity : Ceramide that exists in the skin)
· DS-HydroCeramide50 showed a higher penetration efficiency compared to pure ceramide.

Fluorescent microcopy of control and 3D human tissue model treated with emulsions containing DS-Ceramide Y3O or DS-HydroCeramide50 with same content of DS-Ceramide Y3O.