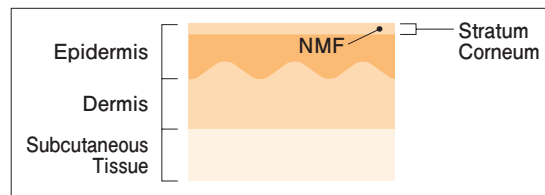


Amino Acid Based Humectant PRODEW® 600

PRODEW® 600 is a highly effective moisturizer formulated with NMF (Natural Moisturizing Factor) components. The amino acid composition of PRODEW® 600 is almost the same as the amino acid composition in NMF.

PRODEW® 600 gives the moisturizing effect to the skin by supplying amino acids to the stratum corneum. In addition, since preservatives, such as Parabens, are not used, it is possible to formulate PRODEW® 600 into personal care products with preservative-free concept.

● Structure of skin

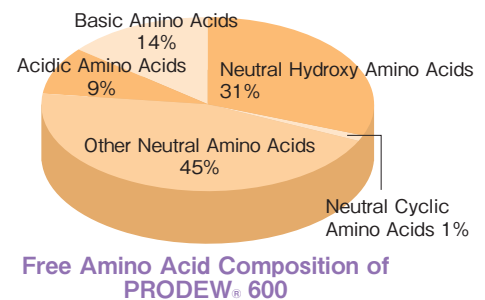
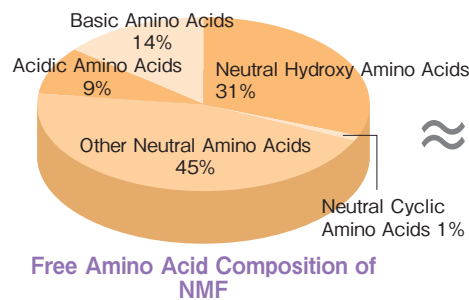


NMF is present in stratum corneum and plays an important role in maintaining skin moisture.

● Components of NMF

Amino Acids	42%
PCA	12%
Lactic Acid	11%
Urea	7%
Others	28%

Source : H.W. Spier, G. Pascher, Hautarzt, 7,55-60 (1956)



Major Applications

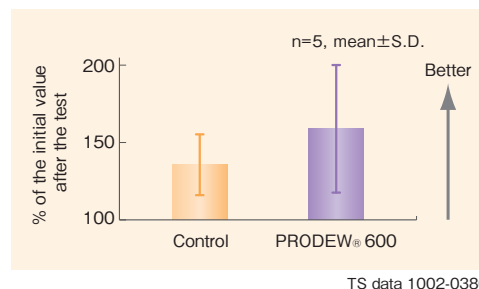
- Skin Care Products : cream, lotion, facial cleanser, shower gel, body soap, etc.
- Hair Care Products : shampoo, conditioner, hair tonics, hair cream, etc.
- Sun Care Products : pre and post sun care cream, lotion, gel, etc.
- Make-Up Products : foundation, lipstick, etc.

Characteristics

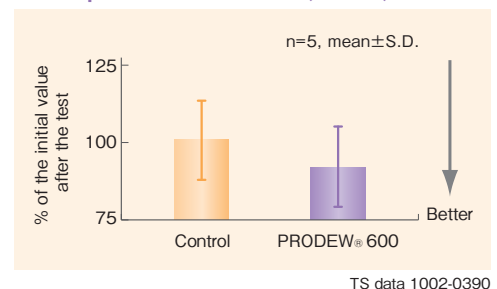
● Improvement of Skin Condition ; Long-term test (Cheeks)

Skin capacitance and skin barrier function are improved by a skin toner and a skin cream including PRODEW® 600.

Water content of stratum corneum



Transepidermal water loss (TEWL)

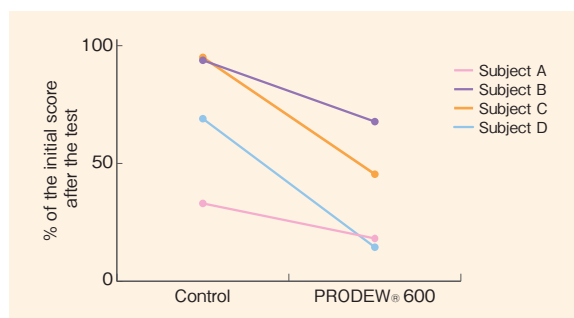


Method : Skin toner and skin cream had been applied to cheeks every morning and evening for 2 weeks.
Control : Skin toner and skin cream without PRODEW® 600
PRODEW® 600 : Skin toner with 5wt% PRODEW® 600, Skin cream with 2wt% PRODEW® 600

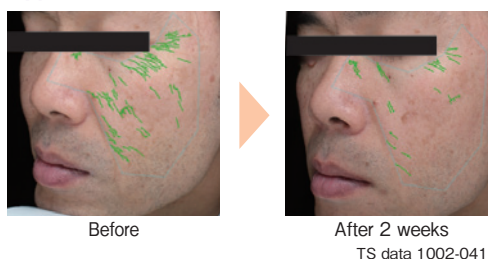
● **Anti-wrinkle effect ; Long-term test (Cheeks)**

Fine wrinkles are decreased by a skin toner and a skin cream including PRODEW® 600.

Wrinkle Score



Appearance



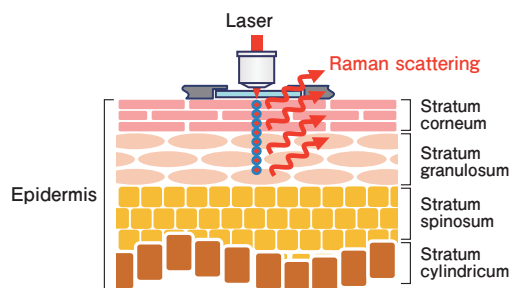
Method : Skin toner and skin cream had been applied to cheeks every morning and evening for 2 weeks. Wrinkle score and appearance were measured by VISIA® Evolution.
Control : Skin toner and skin cream without PRODEW® 600
PRODEW® 600 : Skin toner with 5wt% PRODEW® 600, Skin cream with 2wt% PRODEW® 600

● **Penetration into stratum corneum**

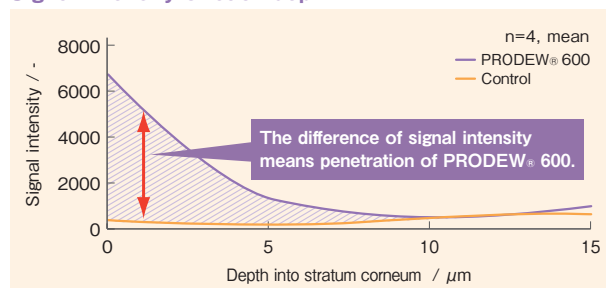
Raman peak derived from PRODEW® 600 is detected from the skin surface to the depth of the stratum corneum around 10µm.

Figure of confocal raman spectroscopy

Since Raman scattered light of the target component can be measured at each depth of the skin by in vivo confocal Raman spectroscopy, it is possible to evaluate the skin penetration of applied substances.



Signal intensity of each depth



Method : Skin toner was applied 3 hours before measurement. The signal intensity was measured by in vivo confocal raman spectroscopy.
Control : Skin toner without PRODEW® 600
PRODEW® 600 : Skin toner with 5wt% PRODEW® 600

Material Information

Product Name	Product Code	Chemical Name	CAS No.	Physical Form	Packaging	PCPC INCI Name	Composition (%)
PRODEW®	600	Trimethylglycine	107-43-7	50% Aqueous Solution	22kg Drum	Betaine	26.87
		Sodium L-Pyrrolidone Carboxylate	28874-51-3			Sodium PCA	9.75
		Sodium Lactate	72-17-3			Sodium Lactate	5.00
		DL-Pyrrolidone Carboxylic Acid	149-87-1			PCA	3.78
		L-Serine	56-45-1			Serine	1.12
		L-Alanine	56-41-7			Alanine	1.06
		Glycine	56-40-6			Glycine	1.00
		L-Glutamic Acid	56-86-0			Glutamic Acid	0.43
		L-Lysine Hydrochloride	657-27-2			Lysine HCl	0.34
		L-Threonine	72-19-5			Threonine	0.32
		L-Arginine	74-79-3			Arginine	0.29
		L-Proline	147-85-3			Proline	0.04
		Water	7732-18-5			Water	balance

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