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Superior Skin Care Effects of Facial Masks

Yukio Heki, M.S., Kesyin F. Hsueh, Ph.D., Nahoko Sakae, B.S.
P&G Beauty, Kobe, Hyogo, Japan

INTRODUCTION

Fabric substrate-based facial masks have been an important supplement to the skin care regimen of Asian women. Most users recognize skin improvement and a positive in-use experience. This investigation result elucidates the potential skin effect mechanisms via clinical designs and trials.

OBJECTIVE

The purpose of this multi-study is to characterize multi-layered stretch mask technology via investigating ingredient deposition/ penetration, hydration and lift achieved through using this mask versus a flat, single layer mask.

METHODS

Clinical preparation: *in vivo* study with acute and chronic application of mask with formula, involving single or multiple visits of randomized Japanese panelists (n=50), ages 32-52, who had applied basic skin care regimen as base-line control. Protocols: DANAE three-dimensional facial topography analysis comparing cotton and other substrate masks, active skin penetration by tape stripping method, Comeometer, VISIA, Optical Coherent Tomography (OCT) comparing liquid only and various substrate masks.
Formulation: key formula and anti-aging ingredient investigated include Niacinamide, glycerin, cosmetic-grade humectants, and typical skin care formula chassis.

Facial Mask

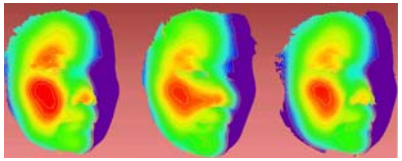
is a fabric substrate immersed and saturated with cosmetic liquid, which comprises anti-aging ingredients, organic and inorganic solutes, and emulsifiers in a principal phase of oil or water. Engineering fabric for best skin friendliness and fluid partitioning requires spunlacing hydrophilic cotton and rayon fibers with hydrophobic polyolefin micro fibers with stretchable structure. Applying mask on full face for fifteen minutes allows high level of cosmetic fluid deposition on skin.

	Substrate A	Substrate B	Substrate C
Raw Materials	Cotton	Rayon & Polyolefin	PET/PE & Pulp
Structure	Cotton	Rayon Polypropylene Rayon	PET/PE (fine fiber) Pulp PET/PE (fine fiber)
H*phillic / H*phobic			
Making Process	Spun-lace	Spun-lace	Spun-lace
Stretchability	No	No	Yes

RESULTS

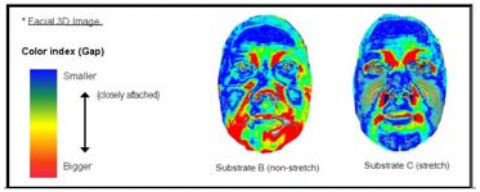
UPLIFTING facial skin with treatment of high-stretch fabric mask was demonstrated clearly by *In vivo* DANAE three-dimensional topography (middle image). The skin lifting effect is quantified as upward shifting of Z-directional facial contouring lines in the broader cheek areas, showing a significant difference versus non-treated skin. The upward shift remained on the face even after mask removal.
SYNERGY of mechanically stretchy material property and high fluid partitioning behavior of the engineered fabric facilitates constant pressurizing on the face and a seamless transfer of treatment fluid. The synergy leads to an optimal condition of uniform coverage of the face via intimate fit of the mask against the face contour lines, even distribution of treatment fluid across the face, pressing of the treatment fluid against skin, and occlusive effect to enhance fluid diffusion rate into skin cells.
SUPERIOR PENETRATION via administration of cosmetic liquid through high-stretch mask is proven with enhanced penetration of moisturizing factors into desquamated cells. This model shows anti-aging ingredient Niacinamide in a multi-layered stretch mask permeates at 240% and125% rate of the same cosmetic liquid only, and flat single layer mask with same cosmetic liquid, respectively. We hypothesize that one mechanism behind the enhanced penetration effect is caused by the continuous release of Niacinamide from the topical concentrating gradient of cosmetic liquid after removing mask off the face, and also enhanced by the physical gradient provided by the multi-layered mask substrate's fluid handling properties
ACUTE and CHRONIC BENEFITS were monitored after fifteen minutes of single treatment and two-week, twice a day for fifteen-minute treatments, respectively.
Parallel OCT result verified skin information obtained from Corneometer, Cutometer, and Venustron.
The clinical trial results were further correlated with visual grading of VISIA images and users' experience survey.

3-D topography: stretch mask increasing uplift distribution (Substrate C)

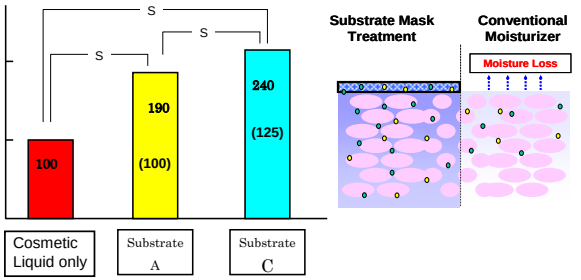


Before application | in use | After removal

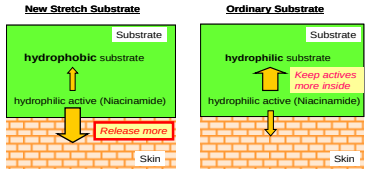
Thermograph illustrates contact between mask and skin. Stretch mask (right) provides more uniform skin contact.



Niacinamide skin penetration is highest in stretch mask (right)



Engineer mask substrate fluid handling properties



CONCLUSIONS

1. Facial mask is an effective supplement to cosmetic regimens for superior skin moisturization and active delivery.
2. High stretch mask provides significant skin firming and lifting effects via contracting force and contouring fit .
3. High stretch mask also provides superior *stratum corneum* hydration effect due to its contouring fit providing more contact with skin, and engineered fluid handling properties.

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