

Advanced Moisture Complex (AMC) is a balanced blend of performance ingredients (moisturizers, humectants, film formers, conditioners, and water-binding agents) each of which address the different causes of dry skin. Each component of AMC is a performance ingredient in its own right, yet none of the components alone provide sustained, long-term moisturization.

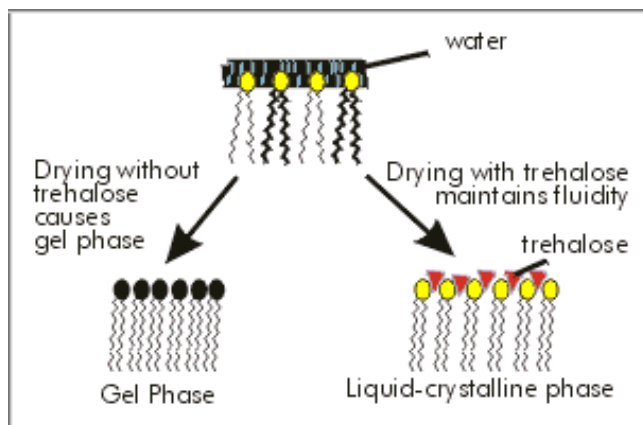
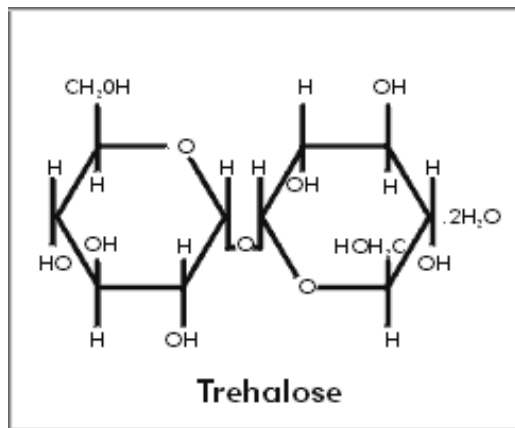
Composition of Advanced Moisture Complex

Glycerin, the humectant component of AMC, prevents moisture loss by holding onto some of the water associated with the skin that would normally be lost to the atmosphere (TEWL). Glycerin can also “attract” water back into the skin from the environment.

Sodium PCA penetrates skin and, like glycerin, retains moisture and slows its eventual loss through evaporation. Sodium PCA and urea are two components that comprise the Natural Moisturizing Factor (NMF).

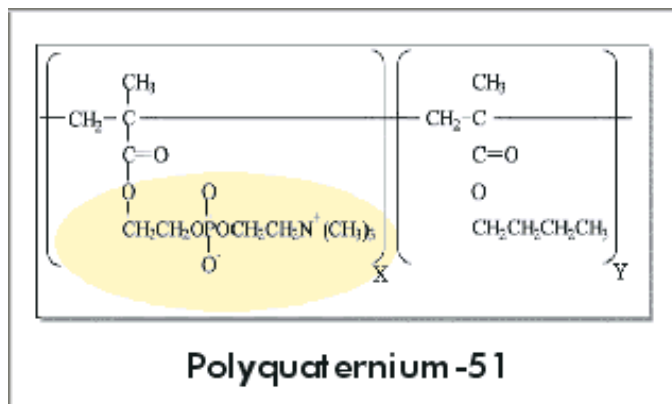
Urea is included in AMC as a facilitator as well as a moisturizer. In small amounts, urea has good water-binding properties. It draws moisture in to the cells of the stratum corneum, assisting the deeper penetration of Natural Moisturizing Factor (NMF) molecules: the nutrients the body uses to keep hair and skin healthy and moisturized.

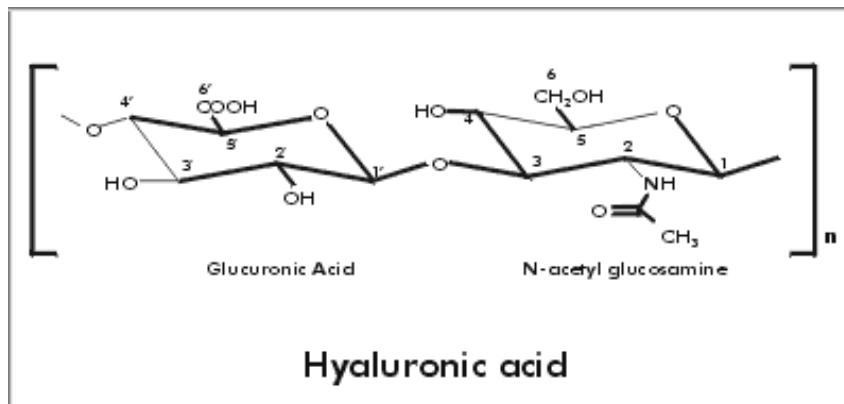
Trehalose is a naturally occurring, non-reducing disaccharide composed of two glucose molecules. In organisms and tissues, it enables survival in conditions of extreme dehydration. On a molecular level, Trehalose stabilizes complex membranes and proteins as water evaporates or is removed. In skin care, Trehalose helps prevent damage from dehydration by maintaining the liquid crystalline lamellar structure of the epidermal lipid permeability barrier.



Polyquaternium-51 2-Methacryloyloxyethyl Phosphorylcholine and Butyl-methacrylate (Lipidure PMB®, The Engelhard and NOF) was developed for the contact lens industry to maintain moisture and counteract dry eye. Structurally, Polyquaternium-51 is a phospholipid copolymer that improves the moisture retention capability of the epidermis. It holds approximately fifty times more water than hyaluronic acid. The phosphorylcholine moiety of Polyquaternium-51 helps stabilize the phospholipid lamella, and functions as a barrier to prevent further water loss as well as forming a protective film on the surface of the skin.

Sodium Hyaluronate is the sodium salt of hyaluronic acid (HA). Sodium hyaluronate molecules are large, spiraled, unbranched chains of repeating disaccharide units of D-glucuronic acid and N-acetyl-D-glucosamine. In the dermis, it aids in cellular repair and preserves moisture balance. Studies have shown that the presence of HA heals wounds faster and the quality of tissue repair is higher with less fibrous scarring. Unfortunately, as skin ages, HA levels decrease dramatically, and the moisture capacity of the skin decreases as well. The disaccharide molecules readily hydrate, creating an ionic barrier as well as a reservoir of bound water. Topical application of HA can help to rehydrate the skin.





Benefit Summary

- Cost effective high performance moisturizer
- Barrier components reduce transepidermal water loss (TEWL)
- Moisture locking mechanism binds moisture to skin surface

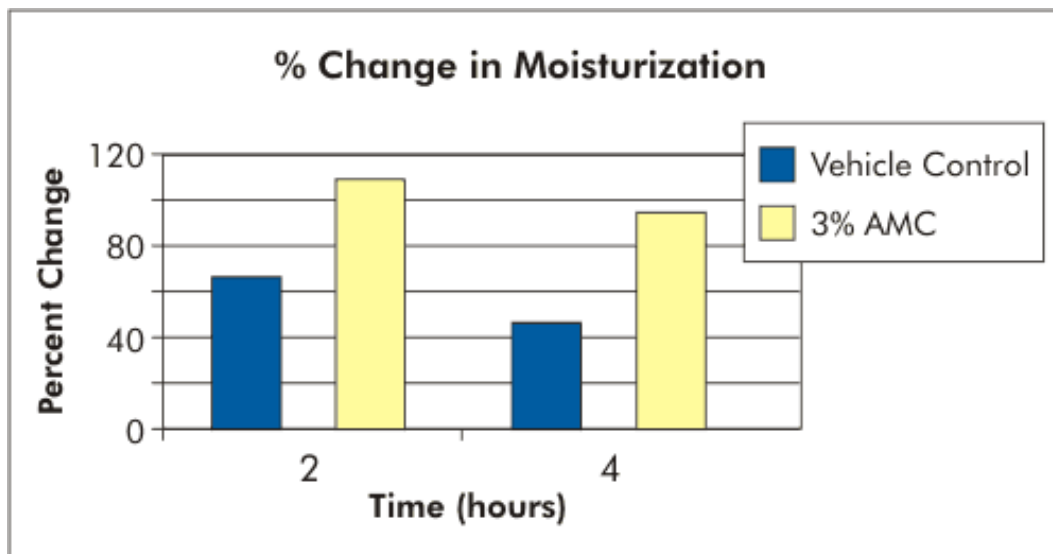
Performance Evaluation

Copies of complete studies are available by request

Rapid Moisturization: AMC at 3%

In a clinical study of 10 subjects on multiple test sites, test vehicles were applied under controlled conditions. Skicon readings were taken at two hour time intervals.

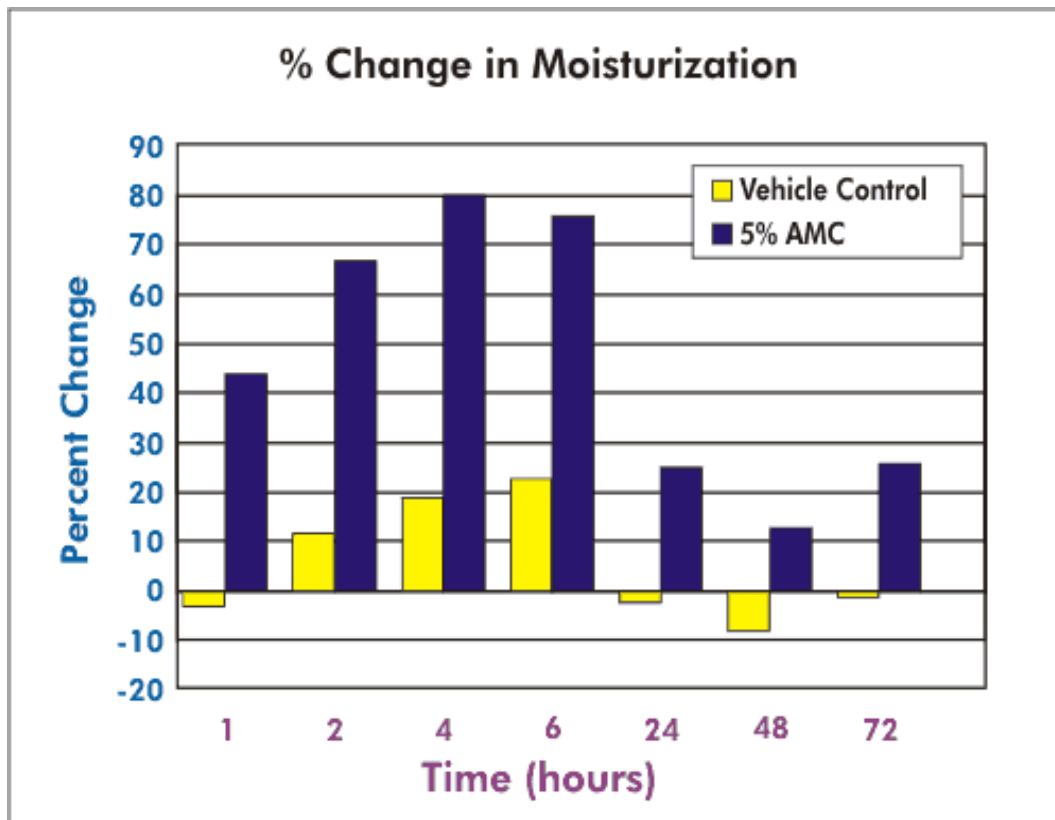
Results: the lotion containing 3% AMC provided rapid hydration compared to the vehicle control.



Long Term Moisturization: AMC at 5%

In a clinical study of 15 subjects on multiple test sites, test vehicles were applied under controlled conditions. Skicon

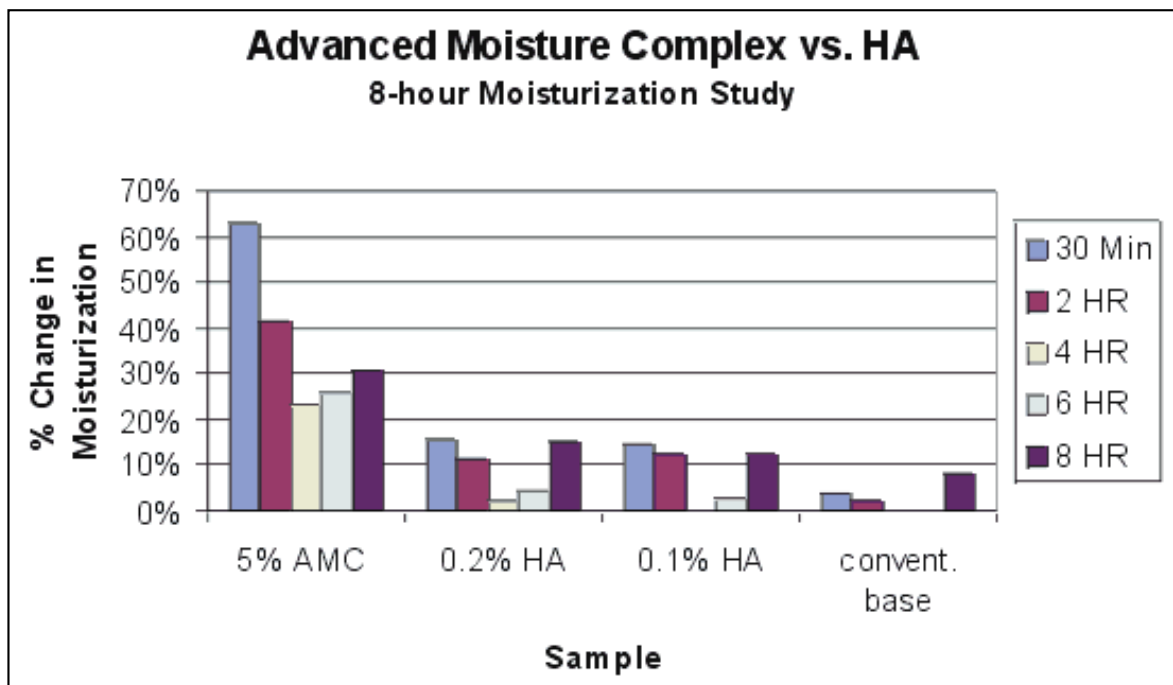
readings were taken at seven time intervals over seventy-two hours.



Moisturization Comparison: AMC vs. Hyaluronic Acid

In a study of 11 subjects with multiple test sites, the products were applied under controlled conditions. Skicon readings were taken at five time intervals.

Results: The formulations containing 5% AMC offer skin hydration superior to those formulations containing Hyaluronic Acid



(HA) alone.

Usage/Applications

Use at levels up to 10%

Application: Skin and hair care. AMC can be incorporated into a wide array of creams, lotions, tonics, shampoos, conditioners, and styling products.

Compatibility / Formulation Tips

No compatibility concerns when used with conventional ingredients.

Formulation Tips — Consider the following in regard to AMC:

- It must be incorporated at temperatures not higher than 80° C. However, depending upon the formulation requirements, it may also be added during the final phase of formulation.
- AMC may be added to the formulation in the same phase as the glycols or glycerin. It may be incorporated alone or in combination with them.
- In formulations containing thickening polymers, AMC should be added to the formula after the polymers are hydrated but prior to the emulsification phase.
- Depending upon the formulation, AMC can either be added by itself, dissolved in a solvent such as a glycol, or blended with “claim” ingredients.
- AMC is not affected by shear of any type used during manufacturing.
- The concentration of AMC to be added to the final formulation may be “dialed” to provide mild to intense moisturization to suit the development profile.

Solubility

Solvent	Solubility
Deionized Water	Soluble
100% ethanol	Insoluble
25: 75 alcohol: water	Soluble
50: 50 alcohol: water	Soluble
75: 25 alcohol: water	Soluble
Corn oil	Dispersible
Olive Oil	Dispersible
Mineral Oil	Insoluble
Butylene glycol	Soluble
Propylene glycol	Soluble
Silicone Oil (Dow Corning 200 fluid)	Insoluble
Salacos 99 (isononyl isononanoate ester)	Insoluble
SLES surfactant	Dispersible

Typical Properties

TEST	ACCEPTABLE RANGE
Color	Colorless to Pale Yellow
Odor	Characteristic

Physical Form	Slightly Hazy to Transparent Liquid
Specific Gravity	1.140 - 1.180
pH	4.60 - 7.25
Microbiology a) Bacteria & Fungi b) Pathogens	<100 cfu/gram Free
Shelf Life	1 year
Storage	Keep sealed at room temperature in a dry place. Store between 18 – 25°C.

Scientific Designations

Product: Advanced Moisture Complex (R10417)							
INCI	Glycerin	Water	Sodium PCA	Urea	Trehalose	Polyquaternium-51	Sodium Hyaluronate
CAS#	56-81-5	7732-18-5	28874-51-3	57-13-6	99-20-7	125275-25-4	9067-32-7
EINECS#	200-289-5	231-791-2	249-277-1	200-315-5	202-739-6	-	2326780
Japan Regis. #	001223	001341	106654	002286	532239	Skin care: 269000 Hair care: 270000	520894 [Sodium Hyaluronate (2)]

Safety Testing

In Ocular Irritation testing of Advanced Moisture Complex displayed minimal irritation at normal use levels.

Human Repeat Insult Patch Test: At normal use levels, Advanced Moisture Complex does NOT indicate a potential for dermal irritation or a potential for allergic contact sensitization.

Summary

AMC is a cost-effective, high performance moisturizer. Its barrier components help to reduce TEWL, and its moisture locking mechanism helps bind moisture to skin or hair.

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1. **Superior Moisturizing Toner with AMC**
2. **Cream with Advanced Moisture Complex**
3. **Conditioner with Advanced Moisture Complex**

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Superior Moisturizing Toner with AMC (CL10212)

	Ingredient	%
A	Deionized Water	84.88
	Propylene Glycol	2.00
	Sodium PCA Ajidew N-50, Ajinomoto	0.25
	HA-Sol™ 2%	0.75
	Advanced Moisture Complex	5.00
	Lactic Acid 88% Syn.	1.50
	NaOH 30% aq. Sol.	1.50
	Micromerol™	1.00
	Hamp-ene 100S Hampshire	0.10
	Glucam E-20 Amerchol	0.25
B	Tween 20 ICI Surfactants	1.50
	Sandoxylate SX-424 Clariant	0.25
	Menthol	0.02

C	Propylene Glycol (and) Diazolidinyl Urea (and) Methylparaben (and) Propylparaben Germaben II, Sutton	1.00
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Procedure: Propeller mix and heat Phase A to 50°C. Premix Phase B until clear, warm to 40°C if needed. Add Phase B to Phase A, propeller mix until clear and uniform. Add Phase C, propeller mix until clear and uniform. Force cool and mix ABC to 25°C. (CL10212)

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Conditioner with Advanced Moisture Complex (CL9223)

	Ingredient	%
A	DI Water	75.40
	Magnesium Aluminum Silicate	0.50
B	Glycerin	3.00
	Germazide® MPB	1.50
	Water and Camellia Sinensis Leaf Extract 99%	0.10
C	Polysynlane® Lite	5.00
	Persea Gratissima (Avocado Oil)	2.00
	Behentrimonium Methosulfate and Cetearyl Alcohol	2.00
	Cetearyl Alcohol and Behentrimonium Chloride	1.50
	Cetyl Alcohol	1.00
	PEG-100 Stearate	1.00
D	Polyquaternium-7	2.00
E	Advanced Moisture Complex	5.00

Procedure:

1. Place Phase A in final manufacturing kettle equipped with propeller mixing. Mix until smooth and uniform.
2. Add Phase B to batch. Mix and heat to 75-77°C.
3. Separately heat and mix Phase C.
4. Add Phase C slowly into Phase AB. Homomix until smooth.
5. Begin cooling. At 50°C, return to propeller mixing.

6. At 40°C, add Phase D into mixing Phase ABC and mix until uniform.
7. Add Phase E, mix until uniform and smooth.
8. Cool to 25°C. (CL9223)

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Cream with Advanced Moisture Complex (CL6946)

	Ingredient	% W/ W
A	DI Water	64.38
B	Structure Zea National Starch	2.10
C	Advanced Moisture Complex	10.00
	Germazide® MPB	1.05
D	Carbomer, 2% aq. Carbopol 940, BF Goodrich	22.05
E	TEA 99%	0.42

Procedure: Propeller mix Phase A, sprinkling in Phase B. Mix to disperse. Add Phase C and mix until uniform. Switch to homomixing. Add Phase D to batch. Using Phase E, adjust pH to approximately 6.5. Homomix until uniform. (CL6946)

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