

## LaraCare™ A200

### Your Multi-Functional Larch Tree Active



INCI Name: Galactoarabinan

SAP #: 179796

#### Key Product Attributes:

- Reduce Transepidermal Water Loss
- Reduce appearance of fine lines and wrinkles
- Reduce emulsion particle size, improve SPF
- Increase efficacy of skin exfoliants
- Excellent substantivity to hair

#### Use Level

1-4%

#### Introduction

Extracted from the larch tree harvested in North America, LaraCare™ A200 is a highly functional polysaccharide. This natural polysaccharide, galactoarabinan (GA), is a natural polymer linked with sugar units consisting of galactose and arabinose in the ratio of 6:1, respectively. It provides many unique properties and benefits in personal care applications.

LaraCare™ A200 is a natural, mild, non-irritating and water-dispersible polymer which could improve the appearance of skin superficial fine lines, reduces transepidermal water loss (TEWL) and provides SPF enhancement.

## Efficacy Studies

### Moisture Control and Humectancy

LaraCare™ A200 works to enhance the skin's barrier properties. Clinical testing has shown its effectiveness for reducing TEWL, and thus, it contributes moisturization benefits to skin care formulations.

#### Clinical Test Protocol

Site	Lower lateral leg
Exposure time	One application
Test formulations	Base without GA (control) Base + 2% GA
Protocol	Transepidermal water loss (TEWL) measurements at 1, 2 and 4 hours after the single application

#### Study Results

- Both formulations, base without GA and base + 2% GA, significantly reduced TEWL at 1 hour after product application
- Only the base + 2% GA formula maintained a significant TEWL reduction at 2 and 4 hours after product application

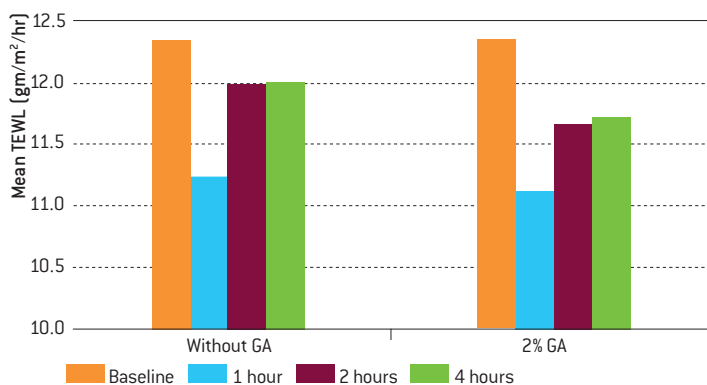


Fig. 1  
Transepidermal Water Loss (TEWL) Study

## Galactoarabinan on the Skin Surface

An *in vivo* evaluation has shown LaraCare™ A200's potential to remain on the skin surface.

#### *In vivo* Test Protocol

Site	Inner forearm
Exposure time	One application; evaluated after drying and two hours post-application
Test formulation	Bare inner forearm (control) Inner forearm + 2% GA in water
Protocol	FT-IR evaluation of GA on inner forearm surface and comparison to bare inner forearm by using a single bounce ATR with a ZnSe crystal. Diffuse reflectance infrared Fourier transform spectroscopy (DRIFTS) for the neat LaraCare™ A200.

#### Study Results

- The FT-IR spectra of the inner forearm treated with 2% GA in water shows peaks (at 1600 and 750 cm<sup>-1</sup>) that do not appear on untreated skin. The appearance of these peaks can only be attributed to GA on skin surface
- The peaks attributed to GA are still evident two hours post application

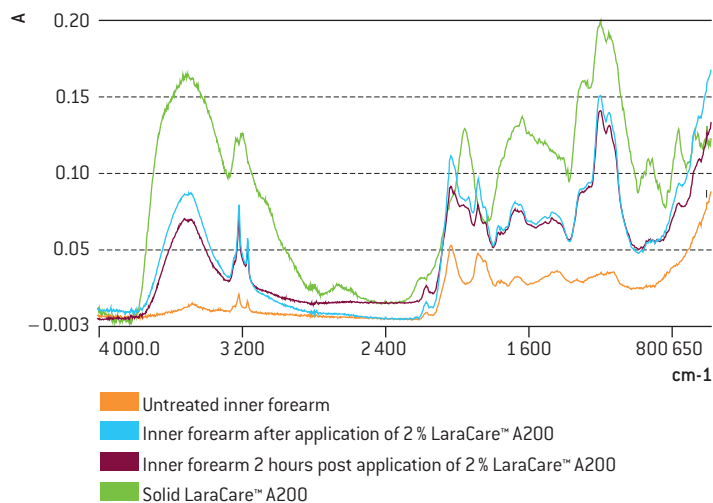


Fig. 2  
FT-IR Analysis Showing Galactoarabinan on Skin Surface

## Skin Treatment Efficacy Evaluation

A clinical study has shown LaraCare™ A200's efficacy in reducing the appearance of the skin's superficial fine lines.

### Clinical Test Protocol

Site	Eyes (crow's feet area)
Exposure time	8 weeks
Test formulation	Base + 5% GA
Protocol	Contour and texture analysis of skin replica casts (prepared using a silicone-based resin) of the eye area at baseline and after the eight-week treatment period to determine the effect of the formulation on the appearance of superficial fine lines.

### Study Results

- Image analysis of the skin replicas showed an improvement of 19% in superficial fine lines after eight weeks of applying the test formula containing 5% GA

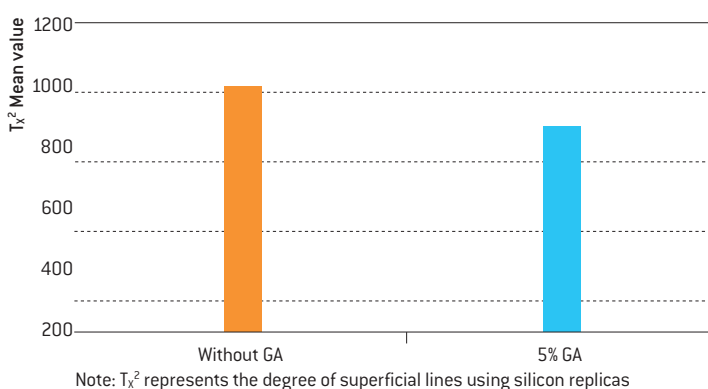
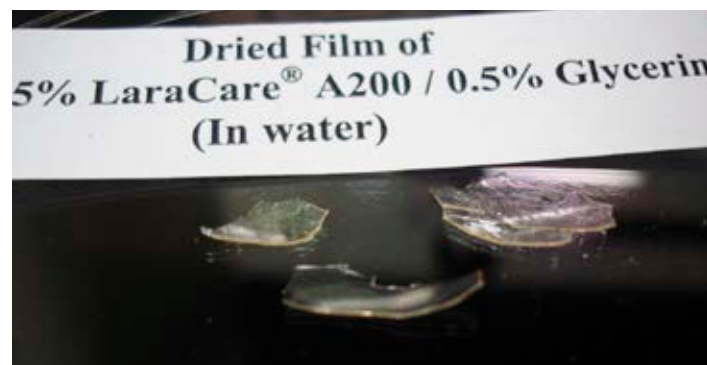


Fig. 3  
Skin Replica Image Analysis of Fine Lines

## Galactoarabinan's Film-forming Potential

Galactoarabinan has potential to form films on skin. LaraCare™ A200 was dissolved in water and glycerin (a typical ingredient in many personal care formulations), placed in a shallow dish and dried at 40°C to evaporate the water. The picture below shows the formation of a film after drying.



## Sunscreen Formulation SPF Enhancement

LaraCare™ A200 has the ability to aid reduction of oil droplet size, as well as ability to improve particulate dispersibility and uniformity. The uniform distribution of sunscreen on the skin surface, promoted by incorporation of LaraCare™ A200 in skin care formulations, appears to contribute to an SPF enhancement.

### Droplet and Particle Size Results

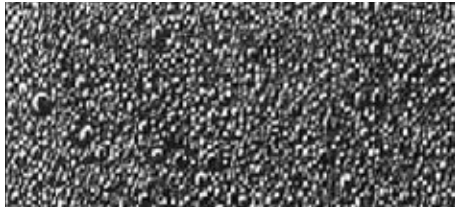
- Emulsion droplet size is reduced to 2–3 microns from incorporation of GA (Fig 4)
- Dispersion of titanium dioxide in the emulsion with GA is more even, much more fine, and without agglomerates (Fig 5)

### Results of GA's Effect Upon SPF Enhancement

- The formulations given in Table 1 include common organic and inorganic sunscreens with various surface treatments at moderate concentration levels. The composition of the base emulsion is shown in Table 2
- Test protocol: In-vitro testing using the SPF-290 SPF Analyzer by Optometrics Corporation, LLC
- Results in Table 1 show SPF enhancements ranging from approximately 5% to as much as 60%. Higher GA levels gave a larger SPF increase



No GA

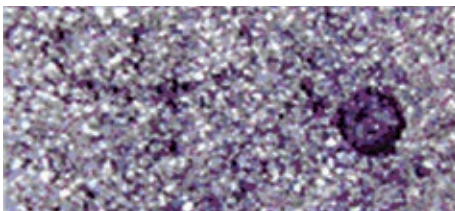


2 % GA

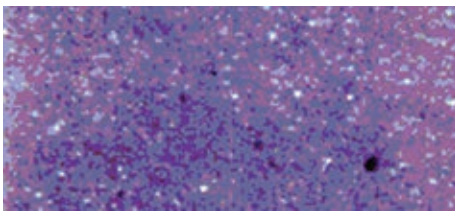


5 % GA

Fig. 4  
The effect of Galactoarabinan upon oil droplets



3 % TiO2



3 % TiO2 with GA

Fig. 5  
Emulsion incorporating Titanium Dioxide with and without Galactoarabinan

### Effect of GA on Sunscreen Blend (Sunscreen/Inactives) SPF

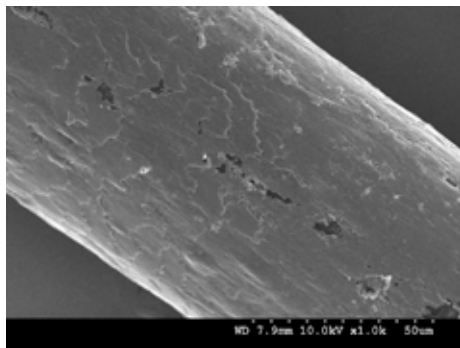
Sunscreen	% GA	SPF	% Increase
Ethylhexyl methoxycinnamate 5%, Ethylhexyl salicylate 5%	0 %	5.54	–
	2 %	7.69	38.8
	5 %	8.60	55.2
Titanium dioxide (and) aluminum hydroxide (and) stearic acid 10 %	0 %	8.60	–
	2 %	9.48	10.23
	5 %	12.13	41.05
Ethylhexyl methoxycinnamate 5%, homosalate 5 %, titanium dioxide (and) aluminum hydroxide (and) hydrated silica (and) alginate acid 3 %	0 %	16.74	–
	2 %	18.41	9.98
	5 %	27.00	61.29
Ethylhexyl methoxycinnamate 5%, ethylhexyl salicylate 5 %, titanium dioxide (and) aluminum hydroxide (and) hydrated silica 3 %	0 %	12.95	–
	2 %	13.76	6.25
	5 %	16.15	24.71

### SPF Emulsion Test Base

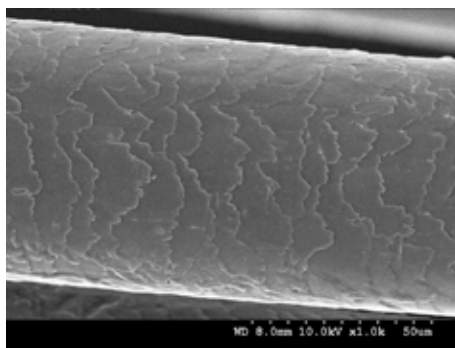
Ingredient	W/W %
Water	qs
Ethylhexyl palmitate	6.0
Glyceryl stearate (and) cetearyl alcohol (and) stearyl lactylate	5.0
Glycerin	3.0
Polysorbate 20	1.0
Xanthan gum	0.5
Preservative	qs

## Hair Protection Study

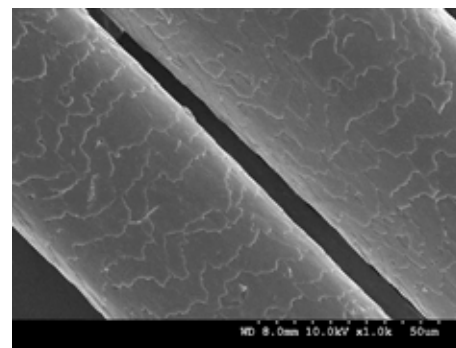
LaraCare™ A200 has fantastic film-forming properties and is substantive to the hair strand. It creates a barrier to help protect the hair from external aggressors such as heat while keeping hair soft and flexible. A study was designed to evaluate LaraCare™ A200's ability to protect hair from heat, using virgin European brown hair tresses treated with 3% LaraCare™ A200 vs. tresses without treatment (placebo). A flat iron was used as the source of heat for the study.



Placebo



Treated with LaraCare™ A200



LaraCare™ A200 vs. Untreated

The placebo shows the damage heat can cause to unprotected hair; raised hair cuticles, holes in the hair strand, dry and brittle texture. The hair treated with LaraCare™ A200 is smooth with no visible signs of damage caused by heat. Hair treated with LaraCare™ A200 is identical to healthy hair which has not been treated with heat, giving you proof positive evidence of LaraCare™ A200's ability to protect hair.

## LaraCare™ A200 Performance in Formulations

- Dispersible in water and easy to incorporate into the water phase of personal care formulations
- Helps to stabilize the emulsion by enabling a smaller oil droplet size
- Helps to preserve the primary particle size of dispersed inorganic powders by reducing the agglomeration tendency of these particulates

## LaraCare™ A200 Formulation Guidelines

- Add to water phase for emulsion formulations
- Typical use levels up to 5%. Expect that use levels as low as 1% in water may be hazy
- Tolerable to pHs 3–13
- Tolerable up to 16% NaCl
- Tolerates typical emulsion processing conditions for shear and temperature
- May affect product viscosity of formulations that contain some synthetic rheology modifiers or natural gum thickeners

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## Product Specifications

### Assay

> 95 % Galactoarabinan

### Physical state

Texture	Free flowing powder
Foreign matter	None
Odor	Slightly aromatic
Color	Off-white to white
Particle size	< 20 % + 40M
Moisture	2–6 %
Viscosity (5 % solution)	max 5.0cps Brookfield LVT dial viscometer Spindle SC4-18 / 25°C

### Microbiological

A.P.C.	max 1000 CFU/g
Yeast	max 10 CFU/g
Mold	max 100 CFU/g

### Heavy Metals

Arsenic	max 0.4 ppm
Lead	max 0.1 ppm
Cadmium	max 4.1 ppm
Mercury	max 0.3 ppm
Total	max 5 ppm

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