

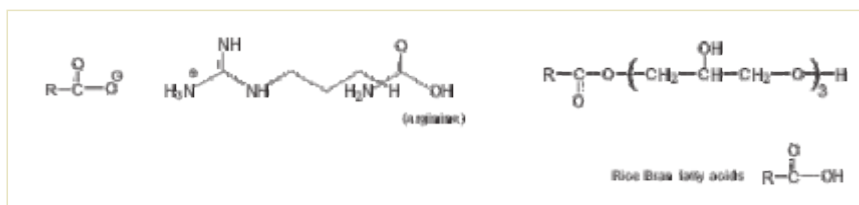


Prolix RB

Function: Emulsifying System O/W
NCI Name: Polyglyceryl -3 Rice Branate
CAS Number: 1166833-04-0,1166833-52-8
REACH Status: Polymer*

PROLIX RB is a product that can be defined as a “PEG Free” functional emulsifying system, capable of forming O/W emulsions that are particularly refreshing, soft and velvety to the touch, enriched by the eudermic properties of rice oil.

It is an emulsifier that works in harmony with nature, which responds to the needs of a market which prefers “gentle” products, endowed with excellent functional properties, that are not tested on animals and that are respectful of man and the environment.

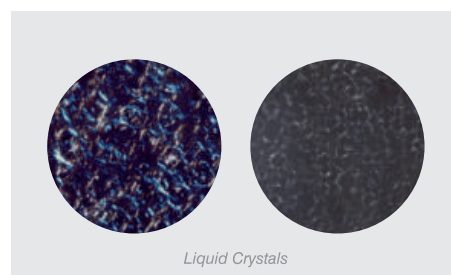


PROLIX RB is derived from “renewable” raw materials.

- POLYGLYCEROL OBTAINED FROM VEGETABLE GLYCERINE
- RICE OIL
- ARGININE

Thanks to its original structure, it opens the way to for a new generation of eco-products created by PRO+

It is an ester obtained through an innovative process between a special polyglycerol and rice oil, a synthesis which does not involve ethylene oxide and does not use chemical reactants or organic solvents; the product is neutralized in the final phase with arginine and reaches an excellent balance which guarantees the molecule's stability and resistance to hydrolysis. The particular connection between the hydrophilic part and the lipophilic fatty chains gives the product excellent emulsifying properties which allow for the creation of liquid crystal structures like thin plates, independent of the chemical structure and polarity of the substances present in the emulsion's internal phase.



The post- micellar organization which the molecules of this emulsion assume is that of a liquid crystal structure in which the bilayer micelles tend to create a multilayer lamellar structure, where the gelation phase of liquid crystals joins the structured interfacial film, contributing to the increase in the system's stability.

For this reason, the emulsions formed are stable and particularly resistant to variations in temperature; when they are present in the oil/water interface, the liquid crystals actually act as emulsion stabilizers making the system rigid and limiting the fluctuation of the interphase components.

* Producers of Polymers are not obliged to register them but must register the monomers from which they are composed, if not already registered, and only where they exceed 2% in weight.



PRINCIPAL CHARACTERISTICS OF PROLIX RB

- Free from polyoxyethylene derivatives: a 'Peg free' emulsion made from renewable raw materials.
- Easy to use, remarkably versatile formulation and compatible with substances and active elements normally used in the cosmetics and pharmaceuticals sector (topical use).
- Excellent tolerance profile which makes it suitable for products dedicated to infancy and even frequent use in the more delicate parts of the body.
- Favourable impact on the environment.
- Can be used as single emulsifier.
- It can be used in formulas with fat phases composed of substances of various chemical natures and different polarities; products that are "difficult to emulsify" such as vegetable triglycerides and silicone derivatives which can be emulsified with no particular problems.
- Can be used with LEE Systems (Low Energy Emulsification).

PROPERTIES OF PROLIX RB EMULSIONS

- Remarkable stability at high and low temperatures.
- Strong resistance to water thanks to the formulation of a hydrophobic film on the surface.
- High sensorial properties and a long-lasting emollient/ moisturizing effect.
- Pleasant sensation of skin freshness.
- Excellent texture.

EMULSIFYING ABILITIES

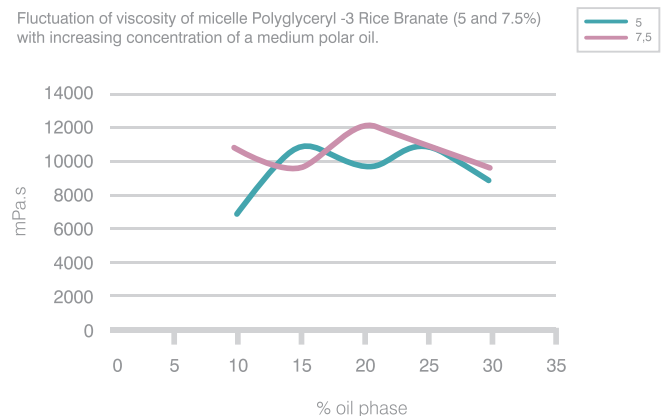
PROLIX RB has been proven compatible with internal phases made of polar, medium-polar and non-polar oils, although it highlights a predisposition to the first two components with which, even at 3%, it has been proven to form stable emulsions.

The diagram on the right shows the fluctuation of the viscosity as the concentration of the oily phase changes, keeping the concentration of the emulsion constant (at 5% and at 7.5%).

The fluctuation of the curves is quite unusual and highlights that, by increasing the percentage of the internal oily phase, there is an increase in the emulsion's viscosity which, once it has reached a " maximum point, tends to decrease and then increase again.

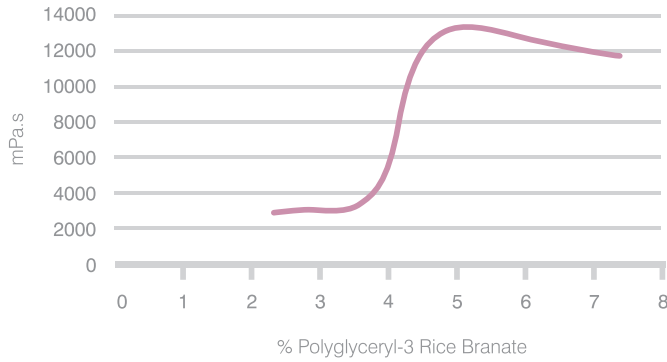
This wavy fluctuation allows it to obtain emulsions of different viscosities by simply varying the percentage of oily or else emulsifying phase; in fact, the two curves seem to balance out by providing the cosmetician the possibility to "play" with these two factors to get an emulsion with the desired viscosity.

Fluctuation of viscosity of micelle Polyglyceryl -3 Rice Branate (5 and 7.5%) with increasing concentration of a medium polar oil.





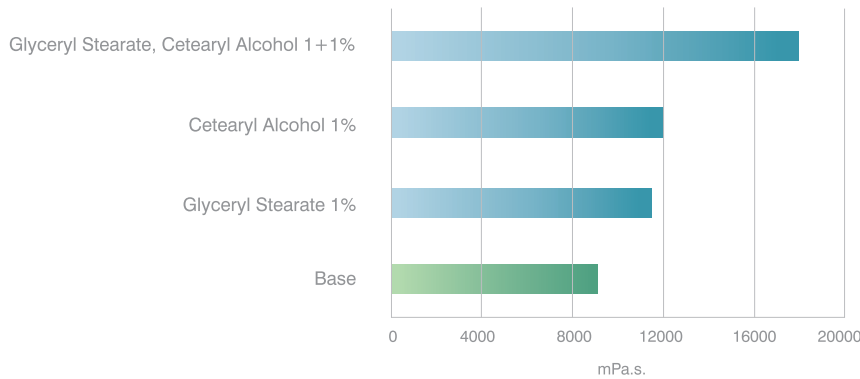
Fluctuation of viscosity of micelle Polyglyceryl -3 Rice Branate to increasing concentration with a medium-polar oil phase at 14%



The graph on the left shows the fluctuation of viscosity of an emulsion in which the percentage of oil phase remained fixed and only that of the emulsifier varied. Observing the curve route, it can be noticed that the viscosity increases considerably going from 4% to 5% of emulsifier (Maximum value).

As the percentage of emulsifier increases further, the viscosity tends to decrease steadily.

This shows that PROLIX RB can be used to obtain fluid, consistent or super consistent emulsions, without interfering with the stability of the system.



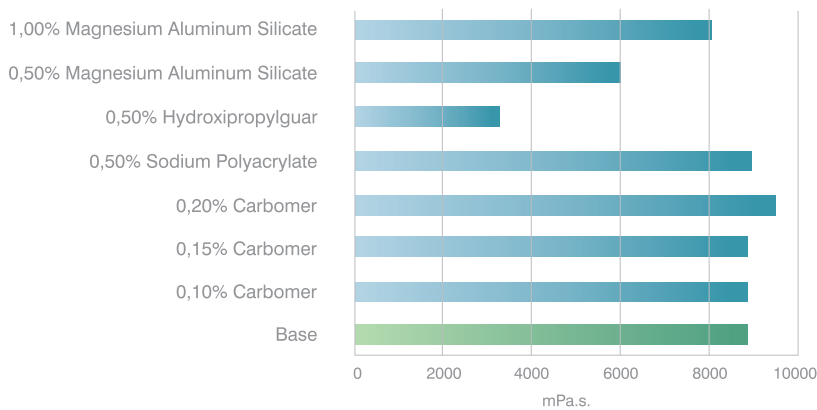
VISCOSITY EFFECT

Effect of body consistency on the viscosity of the “base” emulsion.

The graph above shows the data obtained by relating the “base” emulsion described before (5% of PROLIX RB and 4% of oil phase) without rheological modifiers, with a same emulsion to which some of the most used gelling agents in the cosmetics industry have been added alternately.

The viscosity values obtained demonstrate that the addition of rheological modifiers does not determine substantial variations in viscosity: rather, in the case of Hydroxypropyl Guar and Magnesium Aluminum Silicate there has been an appreciable decrease.

This demonstrates that the desired viscosity can be achieved by intervening on the concentration of the emulsifier, without having to resort to the use of Rheological modifiers which often negatively influence the product's texture.



RHEOLOGICAL BEHAVIOUR

Effects on viscosity by rheological modifiers

The graph above shows the variation of viscosity recorded from the “base” emulsion (5% of emulsifier and 14% of oil phase), as well as from the same emulsion to which some of the most used consistency bodies in the cosmetics industry have been added.

It is evident that their presence, even in modest percentages, determines a substantial increase of the emulsion's viscosity which becomes significant when the percentage doubles.



IN-VITRO SAFETY STUDIES

In vitro skin irritation Tests (SkinEthic) not irritating

Eye irritation test (EpiOcular™) not irritating

APPLICATION AND DOSAGE OF PROLIX RB

- May be used in percentages that vary from 3% to 6%.
- Permits the creation of emulsions of various fluidity and consistency which are hydrating, soothing and give a pleasant light and silky sensation.
- Can be used in formulas containing a high percentage of oil phase.

EMULSIFYING PROCESS

PROLIX RB produces full-bodied W/O systems endowed with an excellent texture even without the important presence of rheological modifiers or specific additives. The emulsions created present relatively modest thixotropic behavior and the viscosity is stable over time and not very sensitive to temperature variations. The product is suitable for processing procedures normally carried out in the cosmetic/ pharmaceutical industry.

The emulsifying procedure which has provided the best results is as follows:

1. Blend the oil stage containing the emulsifier.
2. Heat a part of the water phase (50% approx.) to 65°C approx.
3. Add the first part of the water phase to the oil one and proceed to emulsion.
4. Add the second part of the water phase left at room temperature and work with the turbo-emulsifier for a few minutes.
5. Shake and work for a few more minutes with the turbo and cool at room temperature.

FORMULA EXAMPLES

Sun Cream

PROLIX RB (Polyglyceryl-3 Rice Branate)	5,00
Ethylhexyl methoxycinnamate	6,50
Ethylhexyl salicylate	4,00
Octocrylene	4,00
C12-15 Alkyl benzoate	4,00
Cetearyl Isononanoate	2,00
Butyl Methoxydibenzoylmethane	1,50
Dicaprylyl Ether	1,50
Bisabolol	1,00
Dimethicone	1,00
Lecithin, Tocopherol, Ascorbyl Palmitate	0,05
Aqua	q.b. a 100
Glycerin	4,00
Schizophyllan	1,00
Hydroxypropyl Guar	0,50
Disodium EDTA	0,15
Parfum	q.b.
Preservatives	q.b.
Citric Acid	0,30

Anti Ageing Cream

PROLIX RB (Polyglyceryl-3 Rice Branate)	5,00
Cetearyl Isononanoate	5,00
Dicaprylyl Ether	3,00
Octocrylene	3,00
Squalane4,00	4,00
Ethylhexyl Methoxycinnamate	2,50
Olea Europaea (Olive) Oil Unsaponifiables	2,00
Simmondsia Chinesis Oil	1,50
Glyceryl Stearate	1,00
Dimethicone	1,00
Cetearyl Alcohol	0,50
Aqua	q.b. a 100
Glycerin	4,00
Disodium EDTA	0,15
Cyclopentasiloxane	3,00
Trehalose, Hydrolyzed Vegetable Protein	1,50
Diglycerin, Pinus Pinaster	1,00
Lysine Carboxymethyl Cysteinate	1,50
Hydrolyzed Rice Bran Protein, Glycine Soja Protein, Oxido Reductases	1,00
Parfum	q.b.
Preservatives	q.b.
Citric acid	0,30