



IN-VITRO SAFETY STUDIES

In vitro skin irritation Tests (SkinEthic)	not irritating
Eye irritation test (EpiOcular™)	not irritating

APPLICATION AND DOSAGE OF PROLIX RO

- The percentage applied may vary from 4 to 7%, depending on the quantity of external phase and the quality of the components, without the need for co-emulsifiers or jelling agents.
- It must be introduced in the oil phase and, depending on the ingredients present (liquids or semi-solids) the emulsion may be prepared with a cold process or at low temperature.

EXAMPLE FORMULAS

Liquid Sun Cream W/O	
PROLIX RO (Rice Bran Oil Polyglyceryl-3 Esters)	4,50
Oryza Sativa (Oil)	4,00
Glyceryl Polymetacrylate	3,00
Caprylic/Capric Triglyceride	3,00
Ethylhexyl Methoxycinnamate	3,00
Hydrogenated Poly-1 Decene	3,00
Octyldodecyl Lactate	2,00
Polysilicone-15	2,00
Isopropyl Palmitate	2,00
Butyl Dibenzoilmethane	1,50
Aqua	q. b. a 100
PCActive (Polyglyceryl-3 PCA)	3,00
Magnesium Sulphate	0,70
Tocopheryl Acetate	0,50
Dimethicone	0,50
Preservatives	q.b.
Parfum	q.b.

Anti Ageing Cream W/O	
Aqua	q. b. a 100
PROLIX RO (Rice Bran Oil Polyglyceryl-3 Esters)	4,50
Octyldodecanol	6,00
Dicaprylyl Carbonate	5,00
Glycerin	4,00
Decyl Oleate	4,00
Caprylic/Capric	4,00
Rosa Moschata (Oil)	3,00
Ammonium Lactate	2,00
Juglans Regia (Walnut) Seed Extract	2,00
Prunus Armeniaca (Apricot) Kernel Oil	2,00
Solanum Lycopersicum (Tomato) Extract	2,00
Tocopheryl Acetate	1,00
Magnesium Sulphate	0,70
Parfum	0,20
Preservatives	q.b.

Baby Cream W/O	
Aqua	q. b. a 100
Diethylcyclohexane	6,00
PROLIX RO (Rice Bran Oil Polyglyceryl-3 Esters)	4,50
Glycerin	4,00
Caprylic/Capric Triglyceride	4,00
Zinc Oxide	4,00
Glyceryl Stearate	3,00
Cetyl Palmitate	3,00
Ammonium Lactate	2,00
Olea Europaea Fruit Unsaponifiables	2,00
Panthenol	1,00
Bisabolol	1,00
Tocopheryl Acetate	1,00
Magnesium Sulphate	0,70
Cera Alba	0,50
Stearyl Glycyrhethinate	0,50
Allantoin	0,20
Parfum	0,20
Preservatives	q.b.

Base Emulsion W/O	
Aqua	q. b. a 100
Diethylhexylcyclohexane	6,00
PROLIX RO (Rice Bran Oil Polyglyceryl-3 Esters)	4,50
Hydrogenated Poly-1 Decene	4,00
Glycerin	4,00
Butyrospermum Parkii	3,00
Buxus Chinensis (Oil)	3,00
Oryza Sativa (Oil)	2,50
Almond	2,00
Cera Alba	2,00
Panthenol	2,00
Magnesium Sulphate	0,70
Parfum	0,20
Preservatives	q.b.

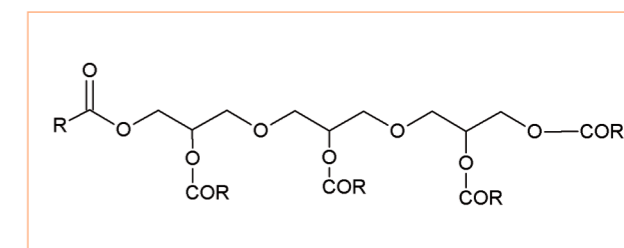
Prolix RO



Function: Emulsifying System W/O
 INCI name: Rice Bran Oil Polyglyceryl-3 Esters
 REACh status: Polymer*

PROLIX RO is a natural emulsifier. W/O PEG free endowed with the excellent eudermic properties of Rice Oil. It presents itself as a clear, oily, amber-colored liquid that is almost odorless. Thanks to its particular composition it is suitable for very delicate cosmetic formulas, for sensitive areas and infants. It has a regenerating effect on the cutaneous barrier which performs a moisturizing and softening action, leaving the skin smooth and soft. The emulsions produced are light, easy to spread, fresh, less greasy and not sticky like external water phase emulsions.

Rice Bran Oil Polyglyceryl-3 Esters 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.



Rice Bran Oil Polyglyceryl-3 Esters is an ester obtained through MWP technology which does not involve ethylene oxide and does not use chemical reagents or organic solvents. With regards to emulsifiers, research has long been geared towards the study of alternative products other than ethylene oxide and propylene derivatives, examining safer and more natural hydrophilic structures. Interesting results have been reached with Polyglycerol esters and triglycerides of plant origins; they are products that come from renewable sources which constitute not only alternatives to the efficiency of polyoxyethylenes, but they have highly functional and sensorial properties.

PROLIX RO derives from "renewable" raw materials:

- POLYGLYCEROL OBTAINED FROM VEGETABLE GLYCERINE
- RICE OIL

PROLIX RO MOLECULES

The post- micellar organization which the PROLIX RO molecules take on 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. The emulsions formed are stable and particularly resistant to temperature variation because, 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.

The "gelation" of the water phase obtainable by means of emulsifiers that are capable of forming a reticular function, which is organized in the form of liquid crystals, increasingly replaces the use of wax substances which are no longer in sync with the modern conception of W/O emulsions which no longer want them to be obstructive, greasy and sticky.

During cooling, the liquid crystal system produced tends to transform into a more complex and rigid phase, which gives the emulsion stability by preventing coalescence. The consequent weakening of the forces of attraction (Van der Waals) limits the free movement of water droplets within such a structured vehicle.

* 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 RO

- Remarkable stabilizing action of A/S emulsions.
- Compatible with chemical and physical solar filters.
- Ability to increase the moisturizing effect of 'skin care' products.
- Effective 'water resistant' effect, particularly suitable for sun products and infants.
- High dust dispersing effect.
- Ability to enhance the sensorial characteristics of 'make-up' products.
- Great inter-facial activity owing to a balanced co-existence of the lipophilic (rice fatty acids) and hydrophilic (polyglyceric chain) parts.
- May be used in "cold" emulsifying processes.
- Simple emulsion process.
- No need for co-emulsifiers or jelling agents.

PROPERTIES OF PROLIX RO EMULSIONS

- Fresh and light texture, pleasant to apply.
- Stable systems even with high polar oil quality.
- Emollient and moisturizing Creams.

COMPARATIVE STUDIES BETWEEN W/O and O/W EMULSIONS

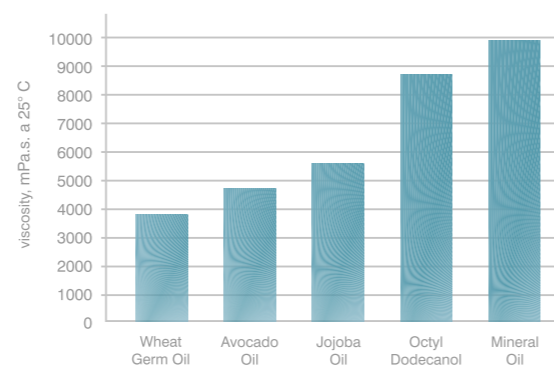
The study has shown that, in similar qual-quantitative conditions, an O/W emulsion just applied to the skin performs a more pronounced emollient effect compared to that of the W/O emulsion. But this effect wears off rapidly. The W/O emulsion needs more time to perform an emollient action, but it keeps the skin feeling soft, elastic and healthy for longer. A W/O cream shows a minor tendency to the growth of microorganisms which find more favorable conditions in the water phase which remains 'protected' from the continuous oily phase. Hydro soluble ingredients and active principles present in the internal phase of the emulsion can find defense from oxidation and better resist during perspiration or contact with water. While a W/O system has these, and many more, advantages, there is however one thing that goes against it; the difficulty in obtaining cosmetically acceptable emulsions that are light, easy to spread, fresh and that do not have the greasy, sticky and difficult to rub in characteristics that have always distinguished W/O creams.

The W/O emulsion is considered a "difficult" colloidal system that is in terms of consumer preferences, production and duration. Despite these difficulties, the water-in-oil formulas market is growing thanks to the evident dermatological advantages of this system.

W/O emulsions require greater mechanical work in comparison to O/W emulsions. The greater the concentration in the oily phase, the less viscosity in the finished product. Even the chemical nature of the components of the oily phase influences the consistency of the emulsion.

The graph on the right shows the variations in viscosity in the emulsions created with 30% oil and 5% PROLIX RO.

The consistency and homogeneity of the external fatty phase, such as the dispersion of the water phase, depend on the type of homogenization. The viscosity of the emulsions is influenced by the polarity of the oil used in the external phase; the more the lipid is non-polar the higher the system's viscosity



WATER RESISTANCY

In order to test the emulsion's resistance to water in the external oil phase with PROLIX RO, a Labsphere UV-2000S UV Transmittance Analyzer spectrophotometer and PMMA slides were used. The quantity of the product applied for the test was 0.75mg/cm² and the SPF tests were carried out upon application and after the sublayer had been in water. *

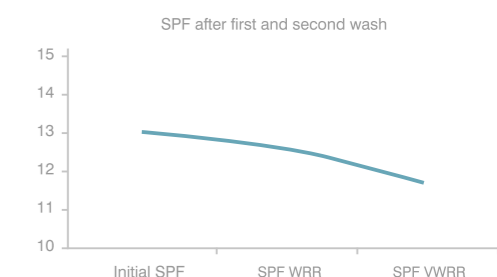
EMULSION 1

Polyisoprene	8,00
Paraffinum Liquidum	7,00
PROLIX RO	5,00
Behenyl Beeswax	5,00
Cera Alba	3,00
Ethylhexyl Methoxycinnamate	5,00
Butyl Methoxydibenzoylmethane	2,00
Aqua	63,00
Glycerin	2,00



EMULSION 2

Polyisoprene	4,00
C12-15 Alkyl Benzoate	3,00
PROLIX RO	3,00
Lanolin Alcohol	2,00
Meadowfoam Seed Oil	1,00
Cera Alba	1,50
Ethylhexyl Methoxycinnamate	5,00
Benzophenone-3	2,00
Octocrylene	2,00
Aqua	74,50
Glycerin	2,00



In the formulas created in the experiment, PROLIX RO proved to create stable emulsion up to 3%, even with an external phase composed of chemical filters and oils of different polarities.

The emulsions tested prove to have an excellent resistance to water. The superficial film created by PROLIX RO is water resistant, but it is light and almost imperceptible; it maintains a pleasant level of skin hydration and leaves the skin smooth and soft. Market interest towards water-in-oil emulsions is increasing thanks to evident dermatological advantages that this system offers. PROLIX RO represents a valid response to this demand, primarily because it has proved to give W/O emulsions properties of lightness, easy spreadability, freshness, reduced greasiness and non-sticky, which typical of external water phase emulsions.