

OLIVOIL PRODUCTS



OLIVOIL SURFACTANT AND OLIVOIL GLUTAMATE

***VEGETAL SURFACTANTS
OF VEGETAL ORIGIN "ECOCERT"***

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OLIVOIL PRODUCTS

“PEG-FREE” SURFACE TENSION MODIFIERS OF VEGETAL ORIGIN INTERNATIONALLY PATENTED



PRODUCTS BACKGROUND

In the modern concepts of wellness, now consisting in the responsible respect of both body and skin equilibrium and environment, the wide success of ingredients of natural origin is due to two key aspects. Firstly, the need for developing formulas as much as possible compatible with the physiology of skin and its annexes, without any adverse effect or allergic potential. Second, the growing confidence of the consumers in the beneficial properties provided by complex mixtures of natural ingredients. The quest for PEG-free surfactants and emulsifiers led Kalichem to the creation of new classes of base ingredients for skin-friendly and environmental-friendly cleansing cosmetic products, the OLIVOIL Series. These ingredients of vegetable origin are ethylene oxide free and highly performing in cosmetic formulations. Moreover, they provide to the skin the pleasant accompanying effects of vegetal structures. The OLIVOIL brand references are based on the multi-faceted combination of OLIVE OIL and vegetal PROTEINS, derived from WHEAT and OAT.

THE ORIGINS



Extra-virgin **Olive** oil is obtained by cold pressing of the pulp of fruits of *Olea europaea* (Olive), a species of small tree of the family Oleaceae, native to the coastal areas of the eastern Mediterranean region, from Lebanon, Syria, the maritime parts of Asia Minor to the south end of the Caspian Sea and successively cultivated in all the Mediterranean area. Its stone fruit, the olive, is of major agricultural importance in the Mediterranean region as the source of olive oil.

Olive oil shows the following average composition, here given in comparison with the most used edible oils:

OILS	SATURATED LIPIDIC CHAINS	MONO-UNSATURATED LIPIDIC CHAINS	POLY-UNSATURATED LIPIDIC CHAINS
OLIVE OIL	16%	75%	9%
PEANUT OIL	19%	53%	28%
SUNFLOWER OIL	11%	33%	50%
CORN OIL	5%	31%	50%
SOYA OIL	4%	23%	59%
COCONUT OIL	87%	6%	2%

Widely preferred to other vegetable oils for its high amount of mono-unsaturated fatty acids, it exhibits well-known properties of integration with the body physiology. Olive oil has the undoubted advantage of its lipidic fraction, provided of a millenary history of contact with vital human cells, which thus allows to boast high safety standards. When the complex of its

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lipidic chains is chemically combined with hydrophilic molecules of known performances, functional ingredients suitable for innumerable cosmetics formulations can be created. Another interesting aspect of olive oil properties concerns its unsaponifiable fraction (0.6-1.5%). This fraction is kept unchanged in the finished material. Its antioxidant power, as well as the emollient effects of the lipidic moiety, contributes to skin normalization and protection.

WHEAT AND OAT PROTEINS

Once were animal proteins... Used as active ingredients of primary choice for most cosmetic formulators, they offered economical, functional molecules of acceptable colour and odour in a variety of forms. For known reasons, today's cosmetic chemist is faced with the challenge to replace the traditional animal-derived proteins with ingredients offering the same functionality. Plants have traditionally been viewed as renewable sources of supply, as they are "harvested" on an annual basis. In addition, consumers often associate plant and vegetable derived products with improved health and cleanliness. Plant proteins are devoid of stigmas associated with the developments in BSE (Bovine Spongiform Encephalitis) and other diseases related to animals.

HYDROLYZED WHEAT PROTEINS



Naturally derived, hydrolyzed wheat proteins contain also wheat oligosaccharides (carbohydrates) and constitute a unique hydrating complex offering a combination of moisture-balancing and film-forming properties. They work synergistically to give better bounce to the hair, and smoother, softer feel to the skin. An exceptional ingredient to add moisturization to lotions, creams and serums, it is also an excellent additive for shampoos, conditioners and body washes.

HYDROLYZED OAT PROTEINS

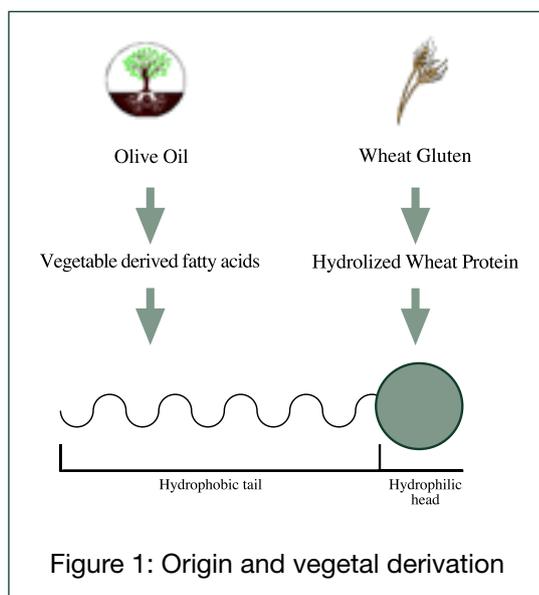


Oat is the only cereal containing a globulin or legume-like protein, avenalin, as the major (80%) storage protein. Globulins are characterized by their water solubility. Because of this property, oats flour may be turned into milk but not into bread. The minor protein of oat is a prolamine (typical cereal proteins such as gluten and zein) called avenin. Oat protein properties are comparable to soy proteins, which the World Health Organization considers to be equal to meat, milk, and egg protein.

The protein content of the hulls of oat kernel ranges from 12 to 24%, the highest among cereals. Moreover, the hydrolyzed protein fraction generally contains an average amount of beta-glucan of 3%. It has skin healing power, stimulates collagen synthesis, promotes cellular turnover, protects and moisturizes the skin. Kalichem Italia srl has selected hydrolyzed proteins from wheat and oat which do not incorporate any genetically modified organisms (GMO).

OLIVOIL TECHNOLOGY

Combining the best of both vegetal oils and protein sources allowed Kalichem to achieve new molecules having relevant interfacial properties (see fig. 1):



These new surface-active agents can be used to formulate 'totally natural' finished cosmetic products that are very suitable for sensitive skin, baby-care, hair-care and personal-hygiene. Furthermore, beside being extremely performing as vehicle ingredients (as surfactants and emulsifiers), thanks to their special composition they may act as functional substances with protecting, soothing and restoring ability.

As for their environmental impact, they are characterized of high biodegradability (according to the CEE regulation N.82/242 OECD Method).

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OLIVOIL SURFACTANT

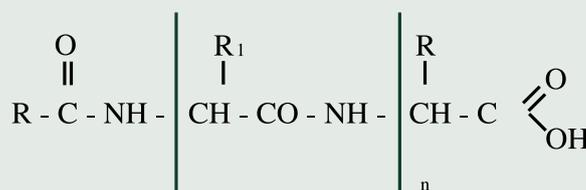
"PEG-FREE" SOFT AND SMOOTH SURFACTANT

OLIVOIL SURFACTANT is a non ethoxylated and non sulphated vegetal-derived surfactant. It is obtained through condensation between the carboxyl group of fatty acids derived from olive oil and the amino group of the hydrolyzed wheat proteins. The result is an amphiphilic structure with a fatty amide bond, having the lipophilic side represented by olive oil fatty chains and the hydrophilic side made by wheat polypeptides (see fig. 2).

CHEMICAL STRUCTURE

The lipophilic part of Olive Oil

The hydrophilic part made up of wheat polypeptides



The carboxyle group is salified with KOH

Figure 2: Chemical structure of the OLIVOIL SURFACTANT

OLIVOIL SURFACTANT is a new generation surfactant, with a mild cleansing ability due to a characteristic mechanism of soil removal. The lipophilic portion has strong affinity for the lipidic fraction of soil, while the grafted peptides, with high water affinity, lead to the aqueous dispersion of the foreign materials. OLIVOIL SURFACTANT is compatible with all traditional surfactants and most standard cosmetic ingredients.

KEY CHARACTERISTICS

In OLIVOIL SURFACTANT, the incidence of amino-acids in the structure is greater than in Olivoil Glutamate, where the ratio between fatty acids and amino acids is 1:1. Indeed, this means that both are highly skin compatible, while the skin protection performance for Olivoil Surfactant can be foreseen as higher. The product is compatible with anionic, non ionic and amphoteric substances. The compatibility with cationic structures must be individually verified. Supplied as potassium salt, when used in systems sensitive to electrolytes, it may influence the viscosity. OLIVOIL SURFACTANT is supplied as aqueous solution (min 26% a.m.) ready to be added in a cosmetic formulation; it does not require any pre-treatment. The addition at temperatures below 40°C is suggested.

COSMETIC APPLICATIONS

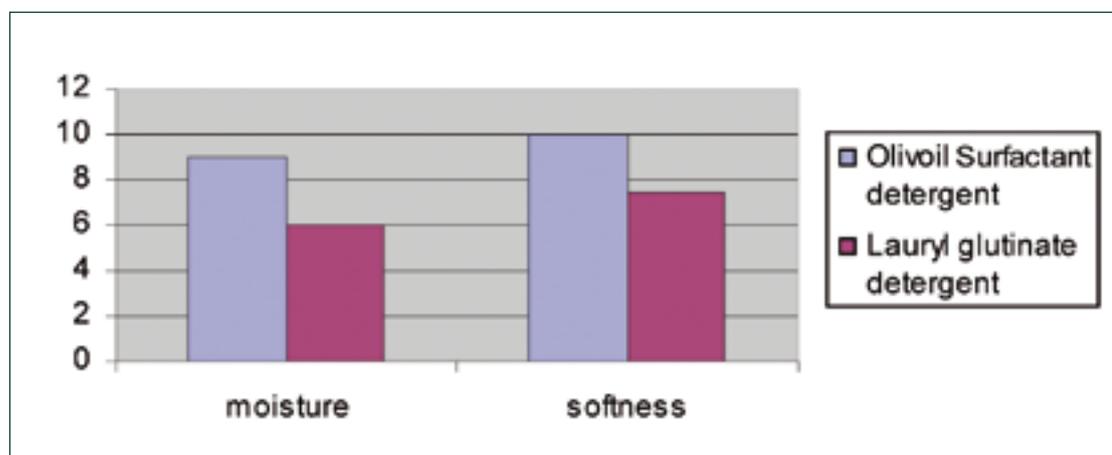
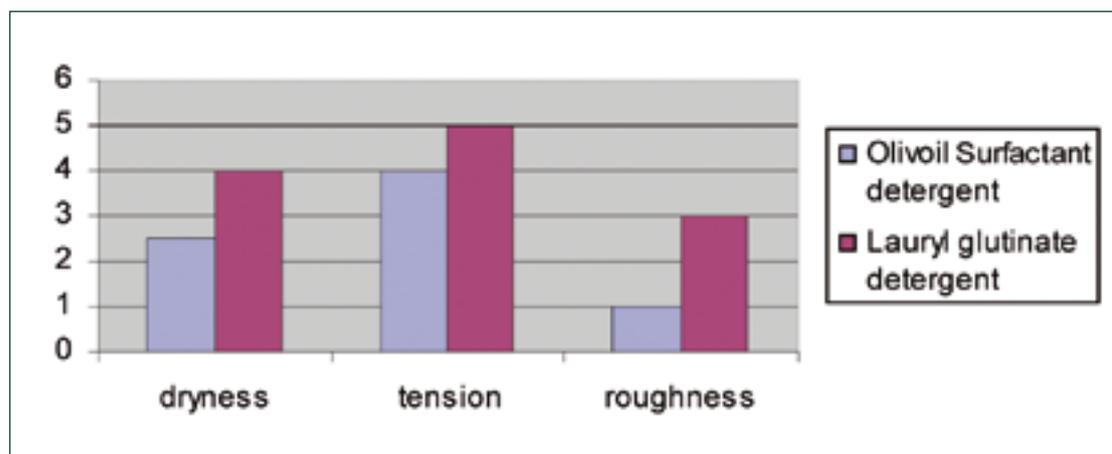
OLIVOIL SURFACTANT, thanks to its lipo-protein structure, can be used in cleansing cosmetic products for skin and hair. Its main characteristics are mildness during the cleansing phase combined with pH and skin moisture balance respect after drying. This unique performance is rarely found in standard and traditional surfactants. The suggested pH range is around 6.0 when employed as main or secondary surfactant.

SENSORY EVALUATIONS

1) Evaluation of skin parameters - OLIVOIL SURFACTANT DETERGENT

The evaluation of skin parameters was carried out following a half-face test protocol by a panel of 20 subject after using a detergent containing OLIVOIL SURFACTANT at 10%. The test sample was used as daily detergent on one side of the face, in comparison with a formula where the OLIVOIL SURFACTANT was replaced by Lauryl Glutinate, on the other side of the face, for 5 consecutive days. Test results are given through the answers of the panellists to a set of questions regarding sensorial skin parameters. Results are herewith graphically reported, considering two groups of parameters:

- negative skin parameters (dryness, tension, roughness)
- positive skin parameters (moisture, softness)



2) Evaluation of cosmetic agreeability - OLIVOIL SURFACTANT PERSONAL HYGIENE DETERGENT

The evaluation of the cosmetic pleasantness of a personal hygiene detergent containing 10% OLIVOIL SURFACTANT was carried out following two test protocols with a panel of 20 subjects:

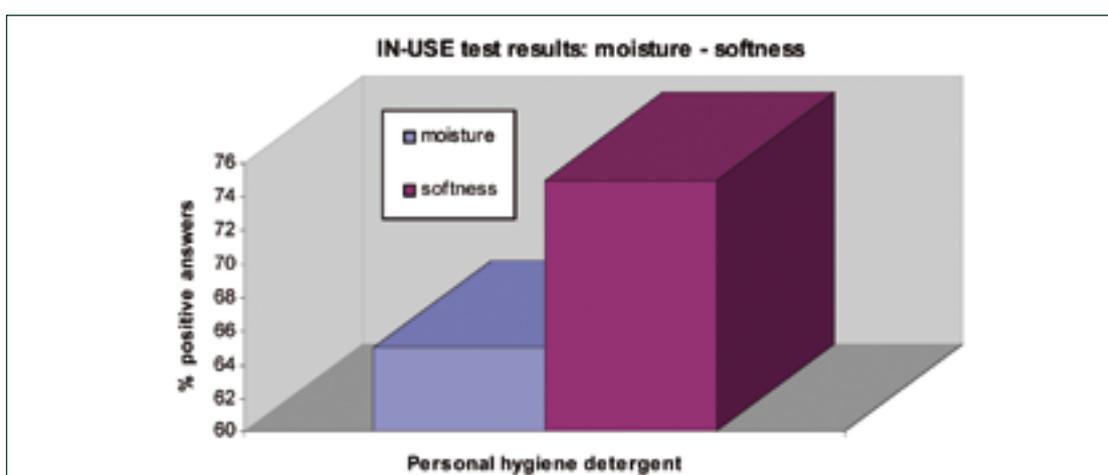
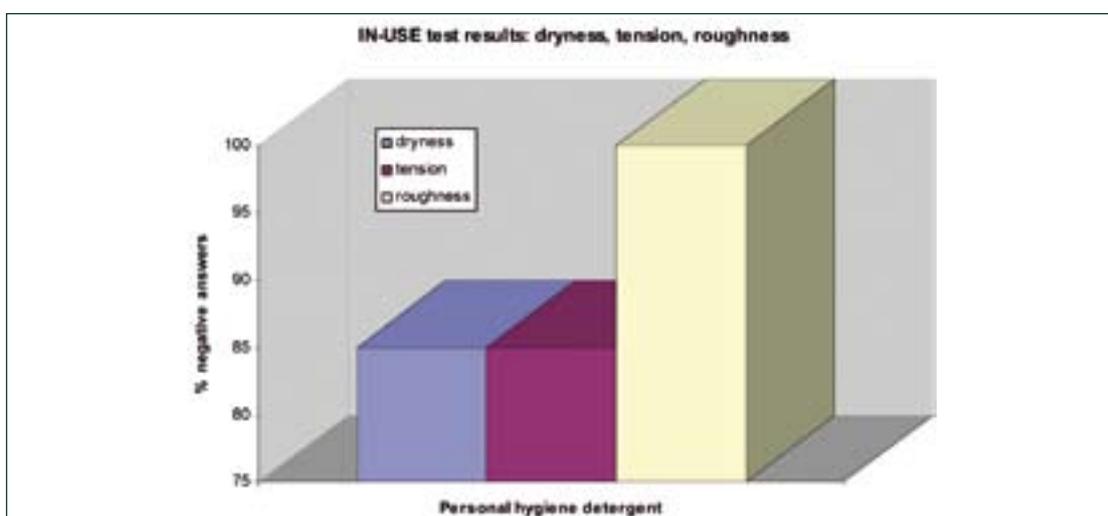
- FLEX WASH TEST, in order to obtain in a short time indications about the irritating power of the formulation (20 subjects, internal part of the forearm, three applications daily, 10 consecutive days)
- IN-USE TEST, with the aim to underline the mildness of OLIVOIL SURFACTANT cleansing (20 subjects, personal hygiene use, one application daily, 5 consecutive days).

The FLEX WASH test results are given by the number of subjects that left the protocol following the first appearance of irritation signs:



The IN-USE test results are given through the answers of the panellist to a set of questions regarding the sensorial skin parameters. The results are herewith graphically reported, considering two groups of parameters:

- dryness, tension and roughness perception parameters: a high percentage of answers indicates a positive assessment;
- positive parameters (moisture and softness perception).



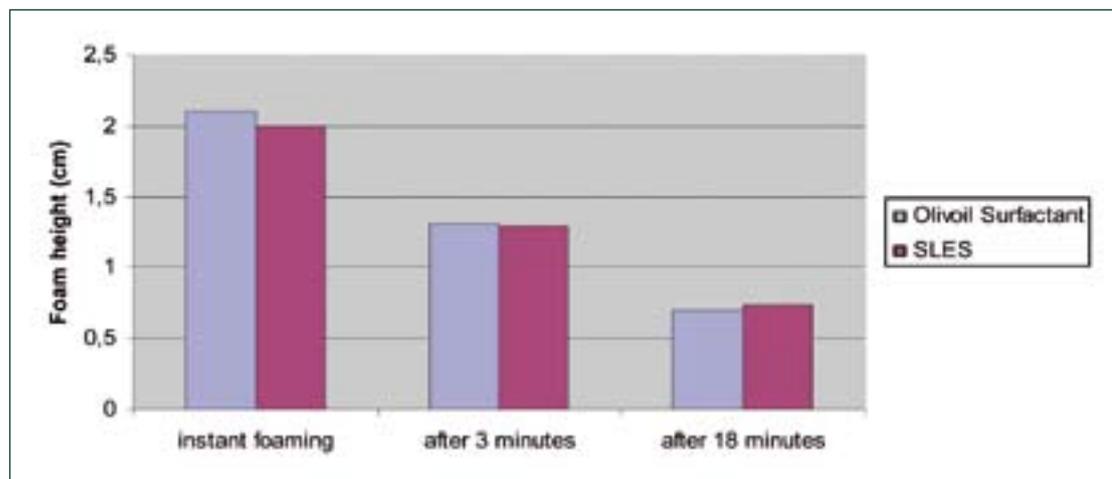
3) In Vitro evaluation of the ocular irritancy of OLIVOIL SURFACTANT

According to this *in vitro* evaluation of ocular irritancy, the product called OLIVOIL SURFACTANT proved to be not irritating.

TECHNICAL EVALUATIONS

1) FOAMING ABILITY

Two solutions were prepared: one containing SLES, the other containing OLIVOIL SURFACTANT. The Ross-Miles method was applied at 20°C, using water @ 15°F hardness and at 1% surfactant concentration (as active substance).



OLIVE OIL AND SOFTNESS OF OLIVOIL PRODUCTS IN THE DETERGENCY

One significant characteristic of the Olivoil Products is given by the presence of long chain fatty acids, including oleic acid (68%), linoleic (9%) and linolenic (0,5%) and others like myristic acid, palmitic acid...

Their presence explains the results of the tests carried out on the surfactants concerning their highly smoothing performance. A number of scientific tests show, in fact, that the molecules with short chain fatty acids, like for instance the lauric acid (12 carbon atoms), have a greater irritant power than the long chain fatty acids whereby the irritant power of a surfactant is influenced by the number of carbon atoms the fatty acid present in the molecule is made of.

These fatty acids of olive oil bond to wheat proteins have more similarities to both cutaneous secretion (sebum) and the cutaneous structures themselves (cheratine) making the Olivoil products very tolerable at cutaneous level and thus giving the finished products containing them a very nice psychoreologic effect.

The Olivoil products carry out an effective functional action, very soft and moisturizing, in the respect of a correct cutaneous physiology.

They leave on the skin a good feel of hydration, smoothness, softness and cleansing: after using a detergent containing an Olivoil product, one has a feel of cleanliness, satisfaction and well-being.

Olivoil products are used in association with aggressive traditional surfactants (like SLES reducing its irritant effect) in percentages ranging from 2% to 15% depending on the desired effect. To merely reduce the irritant effect of traditional surfactants, low percentages

of Olivoil products (2 - 5%) may be employed. Higher percentages of Olivoil products are suggested (5 - 15%) where an immediate feel of hydration, smoothness and softness wants to be additionally achieved. Moreover, the higher is the percentage of Olivoil used, the higher is the sensory eudermic effect obtained.

OLIVOIL SURFACTANT - PRODUCT SPECIFICATION

INCI NAME and COMPOSITION:	CAS No	EINECS/ELINCS	Range %
Potassium Olivoyl Hydrolyzed			
Wheat Protein	-	Biopolymer	25-30%
Aqua	7732-18-5	231-791-2	70-75%

PHYSICO - CHEMICAL ANALYSIS	METHOD	LIMITS
APPEARANCE:	Visual	CLEAR LIQUID
COLOUR:	Visual	YELLOW
ODOUR:	Sensorial	FAINT, CHARACTERISTIC
DRY RESIDUE:	Internal	26 - 30%
pH	Internal	6.8- 8.0
NITROGEN:	Internal	2.2 - 2.8%
MICROBIOLOGICAL SPECIFICATION:	Internal	< 100 UFC/g

SHELF LIFE: 12 months in the original containers

IN-VITRO SAFETY EVALUATIONS

Red Blood Cell test: non irritating.

LPO586: it does not induce any lipo-peroxidation.

IN-VIVO SAFETY EVALUATION

Skin irritation (20 volunteers, epicutaneous patch-test, according to Draize classification): no reactions

APPLICATIONS

Between 2 and 20% in skin cleansing products (foam bath, shampoos, baby care and personal hygiene cosmetics).

OLIVOIL SURFACTANT has obtained the ECOCERT certification (since Nov. 2006)

OLIVOIL GLUTAMATE

LIPAMINOACID WITH SURFACTANT AND FOAMING PROPERTIES



OLIVOIL GLUTAMATE is a non ethoxylated, vegetal-derived surfactant. It is obtained through the combination of fatty acids from olive oil, as far as the lipophilic portion is concerned, and the sodium salt of the amino-acid glutamic acid, obtained from wheat gluten, for the hydrophilic portion. The result is a lipo-amino-acid with surface activity, mild detergent activity with excellent foaming power, suitable for shampoos, soaps, bath foam, as possible examples.

Once applied onto the skin, for the hydrolytic action of the stratum corneum enzymes, the external amide bond is hydrolyzed and the active agent is therefore separated in the constituting molecules: fatty acids and glutamic acid. The free aminoacid becomes part of NMF, while fatty acids, especially oleic and palmitoleic, for their high skin compatibility, enrich the composition of cell membranes in a direct way.

Designed to perform a mild detergent action with perceivable skin improvements, it is the ideal partner of Olivoil Surfactant. Lipo-aminoacids show special properties like antimicrobial effects against a wide range of microorganisms, and can be considered non toxic and only mild irritants. In cosmetics, they satisfy the need of surfactants with multi-functional and bio-compatible characteristics.

KEY CHARACTERISTICS

OLIVOIL GLUTAMATE is supplied as aqueous solution (24-30% a.m.) ready to be added in a cosmetic formulation; it does not require any pre-treatment. The product is compatible with anionic, non ionic and amphoteric substances; compatibility with cationic structures must be specifically verified. Supplied as sodium salt, it may influence the viscosity in systems sensitive to electrolytes. The suggested pH range of use in finished products is around 6.0 when employed as main or secondary surfactant. The addition at temperature below 40°C is suggested.

COSMETIC APPLICATIONS

OLIVOIL GLUTAMATE, when used as a delicate surfactant in shampoo, bubble bath and body soaps, creates excellent abundant and stable foam. It can be used in a wide range of cleansing cosmetics, for obtaining creamy touch and balanced cleansing power.

It has an optimal skin detergent action without harming or irritating it; while, on the contrary, improving the sensorial characteristics of the detergent formula. This surface-active agent is ideal for use in combination with Olivoil Surfactant as it optimises its detergent action.

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Olivoil products are used in association with aggressive traditional surfactants (like SLES reducing its irritant effect) in percentages ranging from 2% to 15% depending on the desired effect. To merely reduce the irritant effect of traditional surfactants, low percentages of Olivoil products (2 - 5%) may be employed. Higher percentages of Olivoil products are suggested (5 - 15%) where an immediate feel of hydration, smoothness and softness wants to be additionally achieved. Moreover, the higher is the percentage of Olivoil used, the higher is the sensory eudermic effect obtained.

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ODOUR:	Internal	SLIGHT, NEUTRAL
ACTIVE MATTER:	Internal	24 - 30%
DRY RESIDUE:	Internal	26 - 33%
pH	Internal	6.0 - 8.0
NITROGEN:	Internal	0.9 - 1.05%
MICROBIOLOGICAL SPECIFICATION:	Internal	< 100 UFC/g

SHELF LIFE: 12 months in the original containers

APPLICATIONS

Between 2 and 10% in skin cleansing products (foam bath, shampoos).
The product is ready to use and does not require any pre-treatment.
The addition to the bulk at temperature below 40°C is recommended.

OLIVOIL GLUTAMATE has obtained the ECOCERT certification (since Nov. 2006)

RANGE PRODUCTS:

OLIVOIL EMULSIFIER

OLIVOIL SURFACTANT

OLIVOIL GLUTAMATE SURFACTANT

OLIVOIL AVENATE SURFACTANT

OLIVOIL PCA

