

Esters: Twisting towards ultimate sensoriality

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The success of a formulation depends largely on the sensory perception and skin feel that the user experiences during and after the application. Thus, sensory attributes can be precisely regulated with a correct selection of raw materials to meet the user's needs.

Thanks to a great sensorial ability, esters are one of the most used ingredients in cosmetic applications. Actually, through the combination of three or more emollients, a huge variety of pleasant textures can be achieved throughout all stages of product use: initial application, rub-in and after-feel.

Together with sensoriality, esters have a large number of properties that are highly beneficial in the personal care market. For example, they excel in the solubilization of organic UV filters and in pigment wetting becoming key ingredients in sun care and color cosmetics formulas.

The trend for cleaner, conscious beauty is a considerable driver for change in the personal care industry. To be fit for the future, companies therefore need to consider the value they can bring to consumers beyond their products in terms of transparency and social and environmental responsibility.

Therefore, the chance to formulate with natural-derived ingredients constitutes a step forward in light of latest conscious beauty trends.

Reacting to market trends

Now, beauty products are conceived to activate the ancestral senses in addition to improving skin appearance and complexion. In fact, finished formulas are now created to lead us through an overwhelming experience. As consumers continue to seek more immersive experiences from their purchases, the

progression towards sensory-based beauty products offers that experiential interaction right in consumers' homes.¹

New trends promote an ever more ethereal beauty routine based on products that bring out natural radiance without being greasy. This can be translated in a constant research for innovative, ultra-light and almost wet textures, able to provide a luminous finish but at the same time sophisticated and very natural.

It is in this context that the choice of raw materials becomes fundamental to achieve a degree of sensoriality and performance in line with the expectations of more demanding customers. Yet there is something more that brands must guarantee along with an excellent 'payoff', uniformity in application, incredible comfort and a new idea of beauty: higher sustainability standards.

The cosmetic market is witnessing a prioritization of the concept of sustainability, which has become a key area of importance. Consumers have high personal sustainability goals and they expect brands to support them in achieving those goals. More than ever, there is a high demand for transparency and traceability around ingredients sourcing and a commitment from manufacturers to consider their products from cradle to grave.²

Conscious beauty is defined as a culmination of a 360-degree understanding of consumers' needs and the environment around them, balancing both intrinsic and extrinsic awareness factors. It not only takes a personalized approach to understand skin types, but consumers also evaluate the wider ethical and environmental impact of a purchase with the same gravity as personal priorities.³

ABSTRACT

The cosmetic market is constantly searching for environmentally friendly compounds and demonstrates an even higher interest in making sustainability-focused choice. Sensory agents represent one of the ingredient category under evaluation for a strong research of a 'green' character. This article presents a range of emollient agents developed by circular economy and upcycling methods through different Mediterranean-based supply chains. Food by-products and renewable sources are involved to create high performing raw materials as a base for clean, sustainable and ethical cosmetics.

Today's key product performance parameters

Cosmetic product performance is based on three pillars, all of which must be considered in any successful product development. These are as below.

- Safety - the protection of the consumer and its environment.
- Efficiency - bringing the performance that guarantees consumer satisfaction.
- Sensory - improving the consumer's pleasure in the use of a product.⁴

Beauty and personal care consumers have become more knowledgeable, more conscientious and more ideological in their buying choices. Performance and results are important to them, but, driven by broader health, environmental and societal concerns, they are also paying much closer attention to the ecological and social impact of the products they use.⁵

This is particularly true of younger generations, who are much better informed in general about the ingredients and products they purchase and actively look for brands that align with their values. However, across all age groups, studies suggest that at least 50% of people buy from brands that act responsibly, even if this means spending more.

Covid-19 helped to accelerate this trend. Indeed, in an Accenture survey in April 2020, 45% of global consumers said they were making more sustainable choices than they had before the pandemic and that are likely to continue to do so.

As well as looking for sustainable and ethical practices at every stage of the production process, conscious beauty consumers place significant emphasis on claims such as 'non-GMO' and 'clean' beauty. They also pay attention to the number of ingredients on a label, tending to take ten or fewer ingredients as an indication of how 'clean' is a product.⁶

Clean beauty is now completely absorbed by the cosmetics sector. In fact, we no longer talk about a trend but a necessity that has led the beauty industry to change its standards heading towards a safer and healthier approach.

Yet today's consumers also want to be amazed by personal care products. The value of a product for consumers is no longer just about how well it performs but also what sensorial experience they feel when it is applied to the skin or the hair. Humans are connected to the world through their senses and it is important to create a very good experience with a product that they can engage with it.⁴

The role of esters

Texture plays a critical role in building an emotional experience and emollients like esters, are key drivers to achieve this goal, in addition to delivering basic functionality. With a strong historical commitment for an inclusive and conscious beauty through the development of high technological ingredients, Roelmi HPC helps formulators to transform their creativity

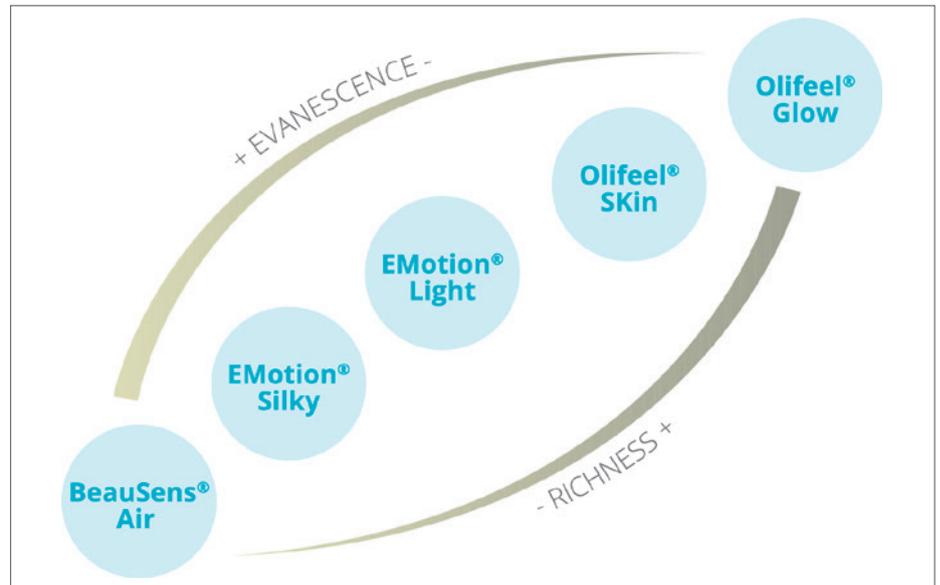


Figure 1: Qualitative sensorial profile of esters in terms of evanescence and richness

into unique products that stand out in the market and can satisfy every type of demand.

At Roelmi HPC, we are balancing resources to empower the planet harmony. As a pioneer of sustainability-driven innovations, Roelmi HPC strictly adopts an approach directed to environmental preservation, towards the biodiversity safeguard and the use of renewable sources.

All those drivers are collected together to live the market following our NIP programme concretely. People and environment safety are crucial components of our philosophy, moving every process and project development.

With our motto, 'The empowerment of the ecosystem', we celebrate the euphony behind our process and the assets we employ in our operations, a brand-new approach to allow the development of compounds to achieve the wellbeing of the entire ecosystem, from the skin to the planet's harmony.

With this approach, we can offer a sensorial journey in which eco-friendly esters will be protagonists to prove how it is possible to create new outstanding sensations on the skin through skin care, make-up and sun care formulas, playing with one or more of these ingredients and creating a perfect 'twist of sensoriality'.

Part of Roelmi HPC's Nature portfolio, these ingredients have been developed following circular economy and upcycling production process, involving the following.

- Olive oil by-products not intended for food use (Olifeel line).
- Vegetable oils extracted from low energy demand and underutilized oil crops (EMotion and BeauSens lines).

Roelmi HPC's esters selection represents the responsible alternative for sustainable cosmetics. Characterized by high performances and safe for topical use, they are the next-gen compounds since today for tomorrow cosmetics.

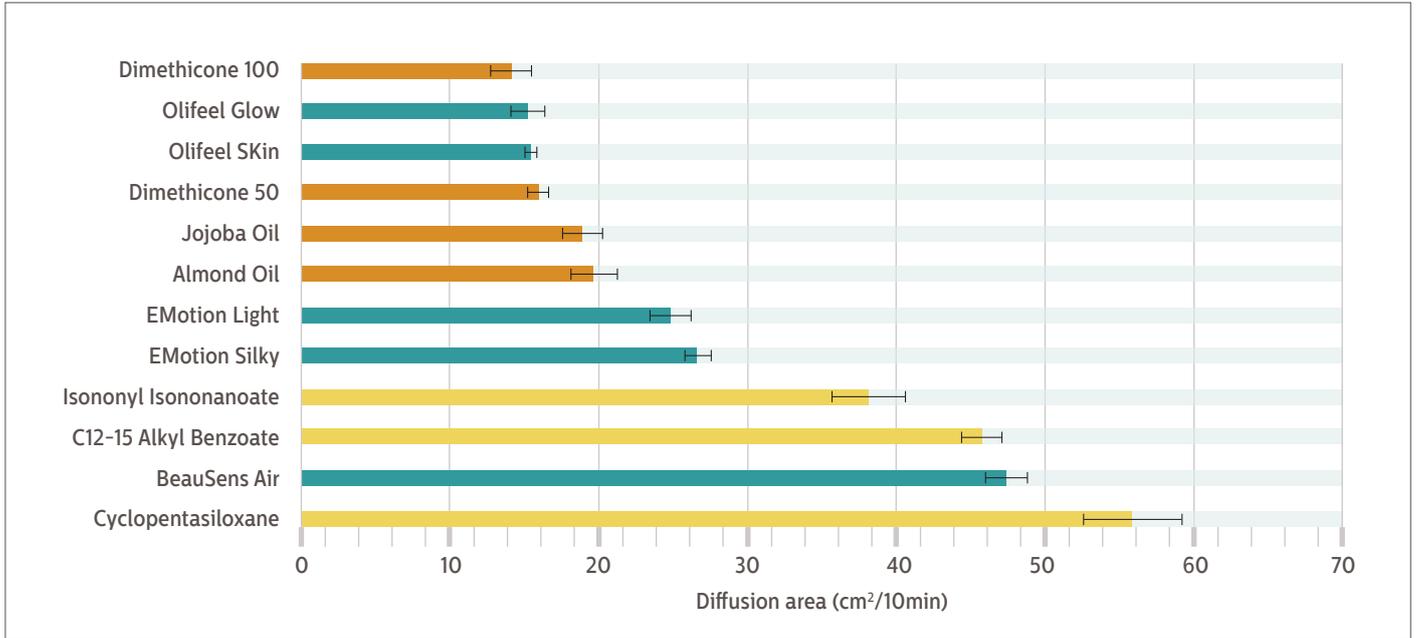


Figure 2: Spreadability test

They are naturally derived – complying to ISO 16128 – and tested for the biodegradability behavior (OECD test 301B). For that reason, they can be the ingredients that make the difference in the toolbox of each formulator especially when it comes to replacing standard raw materials.

Product portfolio

Roelmi HPC's esters offer a range of ingredients that can satisfy every type of demand, in terms of sensoriality and performance. The skin feel is very rich, soft and smooth, and without a greasy effect using: Olifeel® SKin (INCI: Triolein, Glyceryl Dioleate) and Olifeel Glow (INCI: Triolein, Glyceryl Dioleate). It becomes lighter and silky with EMotion® Light (INCI: Tripelargonin) and EMotion Silky (INCI: Neopentyl Glycol Dipelargonate), until reaching a unique evanescence with BeauSens® Air (INCI: Ethylhexyl Pelargonate) (Figure 1).

With a specific focus on spreadability, these esters are positioned among the most used emollients, such as classic oils, silicones, perfectly covering the entire scale (Figure 2). Results have been proven by a spreading test performed by using a filter paper with known porosity and weight, producing a droplet of oil with a volume of 0.2 mL and calculating the area of the patch after 10 minutes. Reported data, obtained from the average of three repetitions, have been expressed as diffusion area in 10 min.

Moreover, BeauSens Air provides a better spreadability in comparison with C12-15 Alkyl Benzoate, one of the most used emollient especially for UV filters solubilization, where also in this case BeauSens Air shows higher solubilization performances especially in relation to UV filters Benzophenone-3 and BMDB (Butyl Methoxydibenzoylmethane).

Sophisticated textures, applications and finishes enable ROELMI HPC's esters to be highly beneficial to skin care, sun care, colour

cosmetics, as well hair care formulations. Just to mention some examples, Olifeel SKin and Olifeel Glow represent the ideal choice when formulators have to create more consistency textures with a longer playtime designed for mature or dry skin and baby care products.

Due to their high compatibility with skin environment, they also help to carry a particular lipophilic active, acting as real boosters of penetration (data not shown).

On the other side of the sensorial scale, EMotion Light and EMotion Silky can be included to achieve an even lighter and silky texture. BeauSens Air is the perfect combination of evanescence and comfort, with a unique touch very close to silicone (like Cyclopentasiloxane and Dimethicone).

It leaves a lightweight, naked skin feel with no residue and a matt finish on the skin. It can be applied in sun care applications to improve the sensory touch from an oily and greasy perception on skin towards an improved and appealing skin feel.

In the make-up world, powder is still the preferred form to create eye shadow, blush, bronzer, and highlighter, because practical and performing. Although they seem easy to realize, these formulas require high technical expertise. In this case, Roelmi HPC's esters work as binders of powders and pigments, improving not only the development, facilitating the compaction process, but also the product performance in terms of coverage, uniformity and colour intensity.

This behavior can be suitable not only for powders but also for all make-up formulas, where in addition an interesting 'colour boost' effect places the focus on vibrant colors, decreasing application time through quick spreading with good pay-off.

Moving to hair world, EMotion and BeauSens Air satisfy every request, both in terms of sustainability and performance on different types of hair. Tests show how both EMotion and BeauSens Air bring great benefits,

improving hair combing, brightness, reducing frizz and making formula delivery easy thanks to a high spreadability. Results also confirmed by hairstylists in saloon.

These products are completely in line with market trends highlighted by Mintel: Naturality and inclusivity as key points, especially in Europe and America.

Conclusion

The personal care is a fast, trend-driven industry. The formulation chemist is asked to develop cosmetic products that meet consumer's expectations in terms of innovation in raw materials and performance. As the demand for unique sensorial experience increases, the challenges are also rising. In addition, there is a growing pressure in finding natural ingredients that can perform to the same high level of traditional chemicals.

Thanks to a unique sensorial ability and versatility in use, combined with a natural origin and a remarkable sustainable character, Roelmi HPC's esters make a difference. Alone or in synergy, to make new generation of cosmetics highly sophisticated. **PC**

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