

## Use of renewable sources in emollients synthesis for the Personal Care industry

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Key words: Renewable, Emollients, Personal Care

### Introduction

The environmental impact of this work has been thoroughly discussed throughout the execution of the project, one of the great drivers of innovation achieved. In Brazil, mineral oil and oil esters correspond to 41% of emollients market, representing a high environmental impact.<sup>(1)</sup> The emollient esters presented in this study, on the other hand, are entirely derived from renewable sources (sugarcane and vegetable fatty acids) and developed according to the Greenformance™ concept created by the proponent, which combines the use of renewable resources, care for the environment, health and wellness. One of the renewable energy sources used in the synthesis of these emollients is the isoamyl alcohol, which is obtained from the distillation of fusel oil, a byproduct of the alcohol industry.<sup>(3)</sup> Oxiteno has therefore developed a new product line containing three different emollient esters under the tradename Oxismooth, that are significantly more sustainable compared to those already on the market. In addition to being an innovative and sustainable solution, the proposed esters have high efficiency for their intended use, as shown application in sunscreen formulations to aid in solubility of the filters.<sup>(2)</sup>

### Results and Discussions

In the Table 1, it is possible to see the common UV filters used in the market for sun protection formulations and some common emollients used to solubilize the filters and their solubility.

**Table 1:** UV Filters - Solubilization. Solubility expressed in % w/w; S = Soluble; I = Insoluble.

UV Sunscreen Emollient	Octocrylene (EU max. 10%)	Butyl Methoxydibenzoylmethane (EU max. 5%)	Homosalate (EU max. 10%)
Mineral Oil	I	I	S
OXISMOOTH ST	9	7	S
OXISMOOTH CO	10	9	S
OXISMOOTH CP	15	14	S
Isopropyl Palmitate	10	9	S
Isopropyl Myristate	10	10	S
C12:15 Alkyl Benzoate	14	12	S

The Oxismooth CP presents similar result when compared to C12:15 Alkyl Benzoate and it is expected for their molecular structure. For Oxismooth CO and Oxismooth ST the results are similar when compared with Isopropyl Palmitate and Isopropyl Myristate, ingredients very used in the marketing for sun care product.<sup>(2)</sup>

### Conclusions

The sustainability, considering the triple bottom line (environment, economic and social), was the key driver of this project and the esters developed present reduced environmental impact, being obtained from natural and renewable sources, through a process of zero loss and minimum waste.<sup>(3)</sup> Since the esters were developed as emollients, which represent one of the principal ingredients in case of personal care formulations, their use means a considerable potential of reducing the environmental impact for this market, by replacing petroleum derivate products. Moreover, the emollients present superior and similar performance when compared to commercial products, constituting an innovative and sustainable solution for skin and sun care formulations and also, meet the desired technical requirements, including greater spreadability, reduced sensation of oiliness / tacky feel and high solubility of organic sunscreens.<sup>(2)</sup>

### Acknowledgment

The tendering company thanks the partner institutions BNDES, CNPq, FAPESP and FINEP, which continuously contribute to the development of its activities in R & D.

<sup>1</sup> Euromonitor International: <http://www.euromonitor.com>

<sup>2</sup> Savary G, Grisel, M, Picard, C. Impact of emollients on the spreading properties of cosmetic products: a combined sensory and instrumental characterization. Colloids and Surfaces B: Biointerfaces. 102, 2013, 371-378.

<sup>3</sup> Garcia, V. Subproduto de destilaria de óleo fúsel: caracterização da composição química e estudo de sua aplicação industrial. Dissertação de mestrado, São Caetano do Sul, 2008.