

Holiferm's sophorolipids are the mildest of them all



HoliSurf HF (high foaming) and LF (low foaming) confirmed as 'non-irritants' following head-to-head testing against comparable surfactants, using a new *in vitro* mildness test by XCellR8



Consumer demand continues to grow for **increasingly mild cosmetic products** that can be applied and left for long periods of time, without concern over irritation or inflammation of the skin.

A 2014 study of 12,377 individuals in Europe found that:¹



With industry calls for new efficacy tests for mildness, XCellR8 developed XtraMild with funding from British government agency Innovate UK.

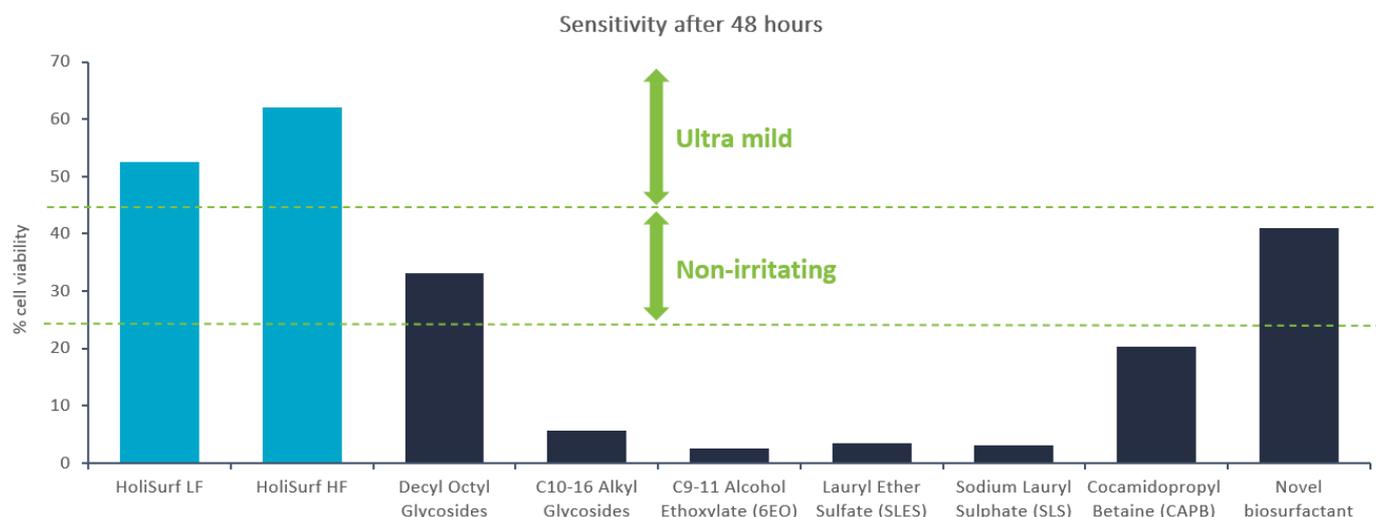
What is the XtraMild test?

- XtraMild is a highly accurate, animal-free *in vitro* test that detects subtle differences between ultra-mild ingredients and formulations.
- Following the application of test products to a skin surface model, readings are taken at set time intervals to determine any possible damage to the skin cells.
- While traditional test methods record readings over an 18-hour period, XtraMild extends this up to 48 hours. This allows for a greater range of readings (including ET50 values), maximising potential for the quantification and benchmarking of results.
- Following initial tests on SLES, SLS, CAPB and a novel surfactant, XCellR8 extended trials for XtraMild to include different molecules and compounds, thereby creating a stronger baseline for comparison with other methods. These tests validated XtraMild, confirming that it produced comparable results to existing methods.

HoliSurf products classified as ‘non-irritants’

The XtraMild *in vitro* test was used to assess the mildness of Holiferm’s HoliSurf HF and LF compared with other surfactants, including Decyl Octyl Glycosides, C10-16 Alkyl Glycosides, C9-11 Alcohol Ethxolate (6EO), SLES, SLS, CAPB and another novel biosurfactant. The results confirmed that **HoliSurf HF and LF were the mildest of all the products tested** by a considerable margin, with both gaining classification as ‘non-irritants’. The difference between HoliSurf products and the comparators became more pronounced over time, with a sharp decrease in the viability of comparators towards the end of the test period.

Assessing the mildness of HoliSurf HF and HoliSurf LF against comparable surfactants



ET ₅₀ (hours)	Expected <i>In vivo</i> Irritancy
< 0.5	Strong/severe Possible corrosive concentration
0.5-4	Moderate
4-12	Moderate to mild
12-24	Very mild
24	Non-irritating



These results show that our naturally based, sustainably produced biosurfactants are better suited for use in personal and cosmetic products than their nearest competitors or petrochemical equivalents. We have also confirmed that sophorolipids are post-biotics,²⁻⁶ defined by the ICCR as ‘*non-viable ingredients comprised of inactivated microorganisms and/or soluble factors (products or metabolic by-products) released by live or inactivated microorganisms, added to a cosmetic product in order to achieve a cosmetic benefit at the application site, either directly or via an effect on the existing microbiota.*’

Biosurfactants of the future

Holiferm will soon bring HoliSurf HF, HoliSurf LF, HoneySurf HF and HoneySurf LF* to the mass market via our first commercial plant, to be built in Wallasey, Liverpool. Our mission is to disrupt the status quo by replacing petrochemical surfactants with biosurfactants manufactured from renewable feedstocks using our patented gravity separation fermentation process.

To find out more visit www.holiferm.com or contact info@holiferm.com

References: 1. Naldi L, *et al.* Prevalence of self-reported skin complaints and avoidance of common daily life consumer products in selected European Regions. *JAMA Dermatol* 2014;150(2):154–163. 2. Lydon HL, *et al.* Adjuvant antibiotic activity of acidic sophorolipids with potential for facilitating wound healing. *Antimicrob Agents Chemother* 2017;61(5):e02547-16. 3. Lang S, *et al.* Antimicrobial effects of biosurfactants. *Fat Sci Technol* 1989;91(9):363–366. 4. Ashby RD, *et al.* Biopolymer scaffolds for use in delivering antimicrobial sophorolipids to the acne-causing bacterium *Propionibacterium acnes*. *N Biotechnol* 2011;28(1):24–30. 5. Díaz De Rienzo MA, *et al.* Sophorolipid biosurfactants: Possible uses as antibacterial and antibiofilm agent. *N Biotechnol* 2015;32(6):720–726. 6. Kapjung K, *et al.* Characteristics of sophorolipid as an antimicrobial agent. *J Microbiol Biotechnol* 2002;12(2)235–241

*HoliSurf HF and HoliSurf LF are also marketed as HoneySurf HF and HoneySurf LF, respectively