

Amphi[®] Sophorolipids

High-activity, multifunctional biosurfactants for use in pulp and paper applications.

Class Sophorolipids

TSCA Certified*



NATURAL

USDA certified as 100% biobased



SUSTAINABLE

Readily biodegradable with industry-low toxicity



GENTLE

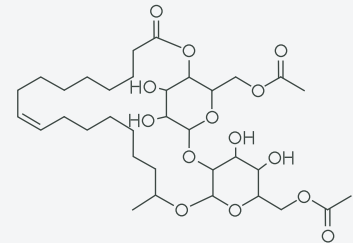
Safe and mild at use level without sacrificing performance



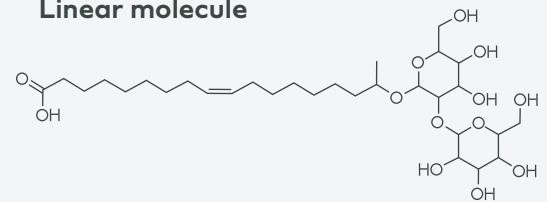
MULTIFUNCTIONAL

Non-ionic and anionic uses, can act as primary or secondary surfactants

Lactonic molecule



Linear molecule



UNMATCHED

in Performance and Sustainability

- ✓ High activity levels
- ✓ Lower usage rates
- ✓ Replace petrochemical surfactants
- ✓ Less water used in manufacturing
- ✓ Higher efficacy
- ✓ Low carbon footprint

FREE from

- ✗ Palm oil
- ✗ 1, 4-Dioxane
- ✗ Ethylene oxide
- ✗ Formaldehyde
- ✗ Proposition 65 chemicals

*Amphi[®] CL & CH TSCA pending

Applications

Amphi® biosurfactants are versatile solutions with unique properties:

- ✓ **Wide HLB 6–12**
- ✓ **Surface tension reduction**
- ✓ **Low CMC**
- ✓ **Small micelle size**
- ✓ **Non-ionic and anionic character**

In formulations, Amphi® enhances performance by acting as a:



WETTING

Promotes release of “stickies” in pulping contact angle reduction and a low CMC



EMULSIFIER

Low HLB and High HLB allows for matched-pair blending



DISPERSANT

Supports small particle size fights re-agglomerations and effective with TiO2 and kaolin



BIOBASED

Potential for removing ethylene-oxide based surfactants from water treatment process

Formulating the Future:

Effective date: January 9, 2023

Parameter	Test	Amphi® M	Amphi® CL	Amphi® CH
Appearance	QC 017	Translucent to clear, amber liquid	Translucent to clear, amber liquid	Translucent to clear, amber liquid
Odor	QC 016	Odorless to slight acidic or sweet smell	Odorless to slight acidic or sweet smell	Odorless to slight acidic or sweet smell
Total sophorolipid content (wt%)	QC 023	≥50	≥50	≥50
Residual oleochemicals (wt%)	AC 002	≤5	≤5	≤5
pH at 0.1% in DI water	QC 005	4.0-5.5	4.0-5.0	4.5-5.5