



Amphi[®] Sophorolipids

High-activity, multifunctional biosurfactants for use in metalworking fluids.

Class Sophorolipids

TSCA Certified*



NATURAL

USDA certified as 100% biobased



SUSTAINABLE

Readily biodegradable with industry-low toxicity



GENTLE

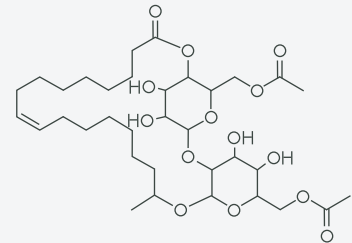
Safe and mild at use level without sacrificing performance



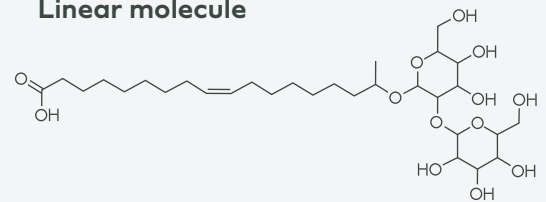
MULTIFUNCTIONAL

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:



EMULSIFIER

Low HLB and High HLB allows for matched-pair blending



WETTING AGENT

Allows for effective cleaning and removal of process oils



ESTER SOLVENT

Promotes the cleaning of process oils



BROAD PH USE RANGE

Amphi M stable pH 3-7 and Amphi CH stable pH 3-12

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