



Dow Industrial Solutions

# Low Foam Surfactants for Metal Cleaning

## Improved Oil Removal with Reduced Foaming



### ECOSURF™ LFE Low Foam Surfactants

Dow has introduced a new low foam surfactant product family to enable improved performance in metal cleaning applications. ECOSURF™ LFE-635 offers efficient oil removal from metal surfaces and low foam generation under circulating use conditions.

ECOSURF™ LFE Series Surfactants are readily biodegradable, low foam surfactants with very low aquatic

Table 1: Typical Product Properties<sup>(1)</sup>

SURFACTANT	% ACTIVES	CLOUD POINT (°C) 1% AQ.	CMC <sup>(2)</sup>	SURFACE TENSION <sup>(3)</sup>	HLB	DRAVES WETTING (SEC)	READILY BIODEGRADABLE	MEETS US EPA SAFER CHOICE CRITERIA
ECOSURF™ LFE-635	100	35	315	32	9.9	17	Yes	Yes

<sup>(1)</sup>These are typical properties, not to be construed as specifications.

<sup>(2)</sup>Critical Micelle Concentration: ppm at 25°C

<sup>(3)</sup>Equilibrium Surface Tension: dynes/cm at 1% actives, 25°C

toxicity, which meet or exceed existing environmental regulations. These surfactants meet the criteria for the U.S. EPA's Safer Choice program.

Key features include:

- Excellent removal of oil from metal surfaces
- Low foam generation in cleaning process

# Comparison to Industry Benchmark

## Metal Cleaning Surfactants

### Excellent Oil Removal Efficiency

ECOSURF™ LFE-635 Surfactant enhances oil removal from stainless steel when cleaned at high temperatures as compared to industry benchmark surfactants. ECOSURF™ LFE-635 Surfactant delivers comparable oil removal performance at low temperatures.

**Table 2:** Cleaning Time (sec) by Surfactant<sup>(1,2)</sup>

CLEANING TEMPERATURE (°C)	ECOSURF™ LFE-635 SURFACTANT	BENCHMARK SURFACTANT
20-25	~150	~120
35-40	~40	> 40

<sup>(1)</sup> Method JB/T 4323.2 (1999) "Standard Oil Soil (machinery oil/petroleum jelly/barium petroleum sulfonate)" on stainless steel.

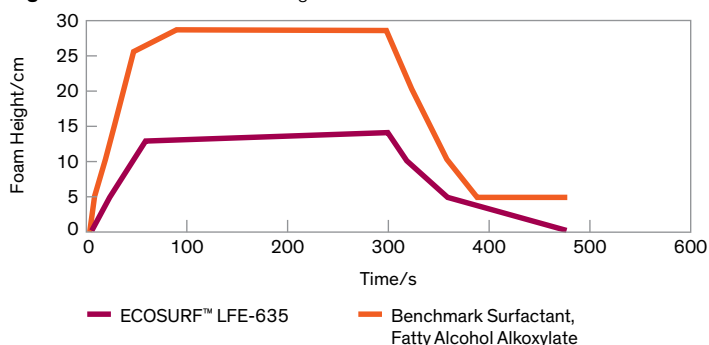
<sup>(2)</sup> These are typical properties, not to be construed as specifications.

For more information on how ECOSURF™ LFE Low Foam Surfactants can improve performance in metal cleaning applications, contact your Dow representative or visit [dow.com](http://dow.com).

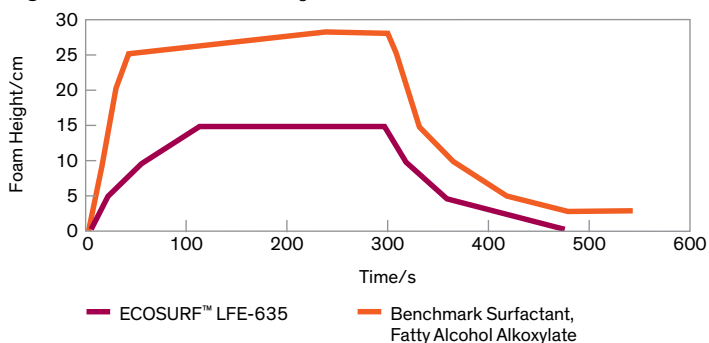
### Reduced Foam in Application

ECOSURF™ LFE-635 Surfactant generates less foam during continuous or circulating process conditions as compared with an industry benchmark surfactant.

**Figure 1:** Circulation Foam Testing at 35°C<sup>(3,4)</sup>



**Figure 2:** Circulation Foam Testing at 40°C<sup>(3,4)</sup>



<sup>(3)</sup> The graphic representations are presented here for illustrative purposes only and should not be construed as product specifications.

<sup>(4)</sup> 0.1 wt % surfactant in water

#### North America

U.S. & Canada 1 800 441 4369  
1 989 832 1426  
Mexico + 1 800 441 4369

#### Latin America

Argentina + 54 11 4319 0100  
Brazil + 55 11 5188 9000  
Colombia + 57 1 219 6000  
Mexico + 52 55 5201 4700

#### Europe/Middle East

00 800 3694 6367  
00 31 115 672626  
Italy 800 783 825

#### South Africa

00 800 99 5078

#### Asia Pacific

+ 800 7776 7776  
+ 603 7965 5392  
+ 86 21 385 1 4988  
China + 400 889 0789

[dow.com](http://dow.com)

NOTICE: No freedom from infringement of any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where Dow is represented. The claims made may not have been approved for use in all countries. Dow assumes no obligation or liability for the information in this document. References to "Dow" or the "Company" mean the Dow legal entity selling the products to Customer unless otherwise expressly noted. **NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.**

This document is intended for global use.  
Published October, 2018.  
© 2018 The Dow Chemical Company