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<b>Company</b>	<b>CLER</b> <a href="#">Website</a>
<b>Product Name</b>	LAS
<b>Status</b>	Reviewed
<b>Supplier Product Number</b>	CLER Standard
<b>Charge Class</b>	Anionic
<b>Chemical Class</b>	linear alkylbenzene sulfonate, sodium salt
<b>Product Description</b>	LAS is any commercial material that has the CAS number and name listed under Components. Specifications are for 100% active LAS; specifications for commercial products vary and should be selected to best meet formulation needs. Commercial product is also available as the sulfonic acid; neutralization with NaOH in liquid formulations yields LAS.
<b>Applications</b>	Hard Surface Cleaner Hand Dish Soap Carpet Laundry
<b>Suggested Uses</b>	Workhorse surfactant for laundry detergents and cleaning products

<b>EU Detergent Directive Compliance</b>	Yes
<b>EU Detergent Directive Comments</b>	LAS complies with the EU Detergent Directive by virtue of the fact that it is readily biodegradable. See environmental data for documentation of LAS ready biodegradability.
<b>Technical Data Link</b>	<a href="http://www.cler.com">http://www.cler.com</a>

## Physical Properties

<b>Physical Form</b>	Solid @ 25°C / 77°F
<b>% Active Surfactant</b>	100 %
<b>HLB</b>	-
<b>pH</b>	-
<b>Critical Micelle Concentration</b>	0.1 g/L
<b>Surface Tension</b>	31 Dynes/cm at 0.1 g/L at 25°C / 77°F
<b>Density or Specific Gravity</b>	1.06 kg/L
<b>Flash Point</b>	-
<b>Cloud Point</b>	-

## Components

Name	CAS	%
<a href="#">Decylbenzene sulfonic acid, sodium salt</a>	1322-98-1	100%
<a href="#">Dodecylbenzene sulfonic acid, sodium salt</a>	25155-30-0	100%
<a href="#">Tridecylbenzene sulfonic acid, sodium salt</a>	26248-24-8	100%
<a href="#">Undecylbenzene sulfonic acid, sodium salt</a>	27636-75-5	100%
<a href="#">C10-C16 Monoalkylbenzene sulfonic acid, sodium salt</a>	68081-81-2	100%
<a href="#">C10-C13 Alkylbenzene sulfonic acid, sodium salt</a>	68411-30-3	100%
<a href="#">C10-C14 Alkyl deriv. benzene sulfonic acid, sodium salt</a>	69669-44-9	100%
<a href="#">C10-C14 Monoalkylbenzene sulfonic acid, sodium salt</a>	85117-50-6	100%
<a href="#">C10-C13 Alkyl deriv. benzene sulfonic acid, sodium salt</a>	90194-45-9	100%
<a href="#">4-C10-13-sec Alkyl deriv. benzene sulfonic acid, sodium salt</a>	127184-52-5	100%

## Ingredient-Level Environmental Summary

**DfE Screen** Yes

### Tier I

Tier I Ingredient Attributes require the submission of test data and third party review. [More Info.](#)

Acute Aquatic Toxicity  [Show Details](#)

<b>Reviewed Category</b>	>1 and ≤10 mg/L
<b>Fish LC<sub>50</sub></b>	1.67 mg/L

<b>Daphnia EC<sub>50</sub></b>	1.62 mg/L
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<b>Algae IC<sub>50</sub></b>	29 mg/L
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### Biodegradability [Show Details](#)

<b>Reviewed Category</b>	Readily Biodegradable
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<b>Percent Degraded</b>	≥60%
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<b>Duration</b>	28 days
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	Meets 10-day window
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<b>Toxic / Persistent Degradation Products</b>	No
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### Tier II

Tier II Ingredient Attributes are required if known and are self reported. [More Info](#).

### Irritancy

Irritating
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LAS was found to be not irritating to skin at concentrations of 1% and 2.5%, moderately irritating at 5%, and more severely irritating at higher concentrations of about 47-50%. LAS is generally not irritating to the eyes of rabbits at concentrations up

**Irritancy Test Results**

to about 1% (some congestion does occur at 0.05-0.5%), moderately irritating at 5%, and more severely irritating at 47-50%. At these higher concentrations the irritation may be present for up to 14 days. In studies that included rinsing, irritation effects diminished with rinsing after 30 seconds of exposure and were slight with rinsing after 4 seconds of exposure. Human experience has established that irritation effects of consumer products containing LAS and other surfactants are moderate, transient and reversible (LAS OECD SIDS Initial Assessment Report, August 15, 2005, p. 25).

**Sensitization** 

Is the ingredient or are any of its components ( @ >0.1% concentration) known to be a sensitizer?


**No**

**Sensitization Test Results**

Skin sensitization studies with guinea pigs showed no sensitization at either lower (6.7%) or higher (50%) concentrations. Results of animal studies, human exposure studies and actual use support the conclusion that LAS does not have significant skin sensitization properties (LAS OECD SIDS Initial Assessment Report, August 15, 2005, p. 25).

**VOC Content** 

**% VOC (w/w)**      0 %

**Presence of APEs** **APEs**

Does the ingredient or do any of its components contain alkylphenol ethoxylates?

No

### Acute Mammalian Toxicity

**Oral LD<sub>50</sub>** 1080 mg/kg

**Dermal LD<sub>50</sub>** >2000 mg/kg

### Tier III

Tier III Ingredient Attributes are voluntary. [More Info](#).

### Risk Assessment

#### Summary of Risk Assessment Conclusions

In view of the extensive database on toxic effects, the low exposure values calculated and the resulting large Margin of Exposure described above, it can be concluded that use of LAS in household laundry and cleaning products raises no safety concerns for the consumers.

The risk characterization as expressed by the PEC/PNEC ratio was below 1 for all environmental compartments. It was concluded that the ecotoxicological parameters of LAS have been adequately and sufficiently characterized and that the ecological risk of LAS is judged to be low. (HERA LAS Human and Environmental Risk Assessment, ver 2.0, May 2004, p. 5)

#### Risk Assessment Link

<http://http://www.heraproject.com/files/4-F-690FDB82-0387-49B5-92889661008359DD.pdf>

### Life Cycle Analysis

**Summary of Life Cycle Analysis Conclusions**

Life-Cycle inventories "do not support fundamental shifts in surfactant usage or feedstock sourcing on the basis of environmental concerns as no single surfactant or feedstock was identified as superior across all resource and emissions criteria examined."

**LCA File**

 [Pittenger et al.LCI.1993.pdf](#) - 1.32 MB

Life-Cycle inventories were compiled to characterize natural resource requirements and environmental emissions of surfactants for detergents and cleaning products. Surfactants examined included linear alkylbenzene sulfonate, alcohol sulfate, alcohol ethoxylate, alcohol ethoxylate sulfate and methyl ester sulfonate. Feedstocks examined included animal fat (tallow), natural gas, palm and palm kernel oils and petroleum.

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**Origin of Feedstock** **Feedstock Type**

None

The available scientific data "do not support fundamental shifts in surfactant usage or feedstock sourcing on the basis of environmental concerns as no single surfactant or feedstock was identified as superior across all resource and emissions criteria examined." See LCA information above.

**Endocrine Disruption** 

Neither LAS nor its sulfophenylcarboxylate biodegradation intermediates displayed estrogenic activity in two in vitro assays. See LAS\_Dossier\_0805.doc (link above), Section 4.9(b) and (c), page 157.

### Other Product Features

very cost-effective surfactant

### Additional Aquatic Toxicity

<b>Chronic NOEC</b>	0.37 mg/L
<b>Microtox EC/LC<sub>50</sub></b>	No Data Entered

### Tier IV

Tier 4 Ingredient Attributes were considered but not recommended for surfactants at this time.  
[More Info.](#)

### Performance Properties

Performance Properties were considered but not recommended for surfactants because ingredient performance depends on the application and the formulation which is at the discretion of the formulator and may be unknown to the supplier.

### Complies with USA Federal Biobased Products Preferred Program

Biobased was considered but not recommended as an attribute for surfactants because the definition of biobased is still uncertain. The justification for including "biobased" is the U.S. [Federal Biobased Products Preferred Program](#) that requires government purchasers to prefer **domestic** biobased products



when feasible. Due to inherent conflicts between the Farm Bill and trade legislation passed by Congress, the definition of biobased may be extended to include bioderived materials sourced from international trade partners. Until the definition is resolved, it is problematic to include biobased as an attribute. The TAC recommended revisiting the biobased attribute once the definition of biobased is resolved.

### Bioaccumulation

Bioaccumulation potential was considered but not recommended for surfactants because surfactants are considered surface active and not bioaccumulating. Bioaccumulation potential will be relevant to other ingredient classes.

### Neurotoxicity

Neurotoxicity was considered but not recommended for inclusion as a surfactant attribute because it is not considered a significant issue with surfactants. Neurotoxicity will be relevant to other ingredient classes.

### Carcinogens, Mutagens and Reproductive toxins (CMR)

Carcinogens, mutagens and reproductive toxins (CMR) were considered but not recommended for inclusion for surfactants because CMRs are not considered to be a significant issue for surfactants. Carcinogenicity, mutagenicity and reproductive toxicity will be relevant to other ingredient classes.



Disclaimer: Only data on acute aquatic toxicity, biodegradability, and degradation products are reviewed by a designated third party for purposes of listing in the CleanGredients(tm) database. All other data and product information are provided by ingredient suppliers who are individually responsible for the accuracy of the information. All TestCorp and GreenBlue Ingredients are fictional and are provided for demonstration purposes only.

If you experience technical difficulties or have any suggestions or comments, please let us know at [info@cleangredients.org](mailto:info@cleangredients.org)