



## MAMMALIAN TOXICOLOGY OF LINEAR ALKYL BENZENE SULFONATES (LAS)

Applicable to these current Stepan products:

BIO-SOFT® D-40 BIO-SOFT® S-101 BIO-SOFT® S-118 NACCONOL® 90G STEPANTAN® DT-60	BIO-SOFT® N-300 BIO-SOFT® S-101 LS BIO-SOFT® S-120 POLYSTEP® A-15-30K BIO-SOFT® D-62 LT	BIO-SOFT® N-411 BIO-SOFT® S-111 H NACCONOL® 40G POLYSTEP® LAS-50 BIO-SOFT® L2 P-123
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Applicable to these inactive Stepan products:

BIO-SOFT® D-53 POLYSTEP® A-4 POLYSTEP® A-15K	BIO-SOFT® S-100 POLYSTEP® A-7	BIO-SOFT® S-130 STEPANTAN® DS-40
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### Toxicological Information:

<u>Test/Conditions</u>	<u>Results/Classification</u>	<u>References</u>
Acute Oral Toxicity (rat) (14 day)	LD <sub>50</sub> (Lethal Dose) ranges from 400-2000 mg/kg (moderately to slightly toxic orally)	EHSMS <sup>1</sup>
Acute Dermal Toxicity (rabbit) (14 day) n = 6 (unabrated skin)	LD <sub>50</sub> ranges from 200-1260 mg/kg as 20% aqueous solution (moderately irritating to skin)	EHSMS
Primary Skin Irritation (rabbit)	Severely irritating as undiluted and non-irritating at 1% concentration	EHSMS
Dermal Sensitization (human) (patch test) n=86	Not a dermal sensitizer	EHSMS
Primary Eye Irritation (rabbit)	Mild to no reaction at 0.1% concentration	EHSMS
Subchronic Oral Toxicity (rats) (diet) (13 weeks)	No adverse effects in rats fed up to 2.5%	EHSMS
Chronic Oral Toxicity (rat) (diet) (2 years)	No increased incidence in tumors in rats fed up to 5000 ppm	EHSMS
Teratogenicity Study (rat) (gavage)	No reproductive or developmental effects were observed at 2 mg/kg	EHSMS

<u>Test/Conditions</u>	<u>Results/Classification</u>	<u>References</u>
Mutagenicity Study (Ames test)	Not mutagenic	EHSMS
Mutagenicity Study (dominant lethal assay) (diet) (9 months)	Not mutagenic at 0.9%	EHSMS

Discussion:

The general problem associated with accidental ingestion of detergents (including LAS) has been widely studied using data reported by Poison Control Centers both in the U.S. and Europe. In most of these instances, very few cases resulted in any symptoms and there were no fatalities. Therefore, evaluation of the extensive safety data available on mammalian toxicity as indicators of human safety, as well as actual human exposure, agrees with the view that the use of LAS in consumer products does not represent a hazard to human safety.

**References:**

1Environmental and Human Safety of Major Surfactants (EHSMS) Vol. 1 Anionic Surfactant, Part 1. Linear Alkylbenzene Sulfonates. Final Report to: The Soap and Detergent Association , February, 1991.

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