



BIODEGRADATION OF AMINE OXIDES

Applicable to these current Stepan products:

AMMONYX® CO	AMMONYX® DO	AMMONYX® LO
AMMONYX® LO-A	AMMONYX® LO-BR	AMMONYX® LO Special
AMMONYX® LO/CO	AMMONYX® M	AMMONYX® MCO
AMMONYX® MO	AMMONYX® SO	AMMONYX® MO 30

Applicable to these inactive Stepan products:

AMMONYX® C	AMMONYX® DMCD-40	
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Biodegradation Information:

Amine oxides are highly removable by conventional sewage treatment systems and biodegrade rapidly and completely under BOTH aerobic and anaerobic conditions. Under aerobic conditions, commercial amine oxides are regarded as being readily biodegradable according to OECD 301 B, D & E test guidelines. In ready aerobic biodegradation OECD screening studies, up to 93% theoretical oxygen (ThO₂) consumption and 97% dissolved organic carbon (DOC) removal was observed.

These rapid measured biodegradation rates are consistent with observations in field monitoring where 90% pipe loss occurs during sewer system transport and >98% AO is removed by conventional water treatment system.

During an anaerobic mineralization study (OECD 303), C10-16 produced 78.9% of the theoretically expected biogas (CO₂/CH₄) in 28 days.

These rates support the conclusion that amine oxides are readily biodegradable under aerobic and anaerobic conditions.

The listed products comply with the EU Detergent Regulation (EC) No. 648/2004.

References:

*ECHA REACH Dossiers for Amine Oxides (CASRN 2605-79-0, 1643-20-5, 3332-27-2, 68955-55-5).

*SIDS Initial Assessment Report for Amine Oxide, 2006.

*Swisher, R.D. "Surfactant Biodegradation" Vol. 18, 2nd Edition, Marcel Dekker, Inc., 1987, pp. 877.

*Cupkova, V., et al; Biodegradation of surface active amine oxide and quaternary ammonium salt germicides. Pharmazie Vol. 44 (8): 577-578), 1989.

*European Committee of Organic Surfactants and their Intermediates: AIS list of environmental data on surfactants.

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