TECHNICAL DATA SHEET

Flexicare™ ZR-LT

Water dispersible zinc ricinoleate

Overview

- Naturally renewable odor neutralizer that traps and absorbs odors (not a masking agent)
- High actives, low moisture zinc ricinoleate complex
- Liquid form for ease of use
- Dispersible in water and readily forms a micro-emulsion
- Can be used in liquid, spray, fogging, or mist applications
- Effectively fixates a wide range of odorous compounds
- Non-antimicrobial for compatibility with skin flora
- Compatible with fragrances and most Personal Care formulating ingredients
- CIR Reviewed zinc ricinoleate as non-toxic and for safe use in Cosmetics
- **INCI name**: Zinc ricinoleate

Applications

- Deodorant Agent in natural deodorants; sticks, sprays and roll-on
- Deodorant Agent in Personal Cleansers and Shampoos
- Effective odor control in pet and veterinary cleansers and shampoos

Technical Information

Flexicare ZR-LT is an Odor Neutralizer, and not an antimicrobial or chemical masking agent. More effective than related copper and magnesium salts of the same valence, and related stearic and oleic acids of the same carbon number, Flexicare ZR-LT zinc ricinoleate forms a unique fixating complex that traps and absorbs odor causing substances. Formulated into a liquid, easy to handle, water dispersible solution, the Flexicare ZR-LT active component zinc ricinoleate is a zinc salt of ricinoleic acid, derived from zinc and a purified fatty acid from castor seed oil, a vegetable oil obtained from the seeds of the *Ricinus communis* plant.

Formulary

Mix before use. Flexicare ZR-LT may stratify upon standing.

The concentration of Flexicare ZR-LT in formulations depends on the application and the target odor causing substances.

Flexicare ZR-LT is readily dispersible in water, forming a micro-emulsion in neutral to slightly alkaline solutions. Dilutions of Flexicare ZR-LT may require additional stabilizers to maintain long-term shelf-life clarity.

Use of deionized water and a preservative is recommended. Preservative effectiveness should be determined by the formulator. Typical active preservative concentrations are 0.05-0.5 weight %.

If a fragrance will be used, some fragrance oils can be pre-dissolved in Flexicare ZR-LT, while others may require their own emulsification package.

Typical Properties

PROPERTY	VALUE
Appearance	Clear to slightly hazy, viscous, colorless to light amber liquid
Odor	Mild
Ionic character	Anionic
Zinc salt actives	30%
Water solubility	Dispersible
pH, as is	9 to 11
Density@25°C	1.05±0.02
Boiling point	>100°C
Flash point	Does not ignite below 100°C
Storage	Protect from freezing
Shelf life	12 months

Packaging and Handling

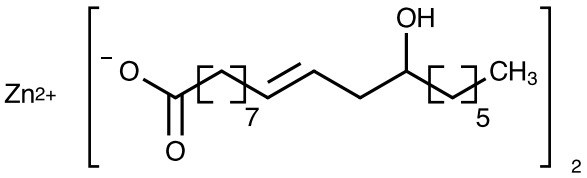
Flexicare ZR-LT is available in:
Totes (Net Wt. 2250 lbs)
55 gallon plastic drums (Net Wt. 450 lbs)
5 gallon pails (Net Wt. 40 lbs).

Refer to the Safety Data Sheet (SDS) for information on the safe use, handling, and disposal of this product.

DOT Classification: Non-Regulated

Whether you're looking for a replacement product or an ingredient for a specific attribute, give us a call. We can provide assistance based upon your particular formulation requirements and composition; please feel free to contact us.

Please refer to back page for important information



Flexicare ZR-LT: Natural Odor Neutralizer

Flexicare ZR-LT is a naturally renewable odor neutralizer that traps and absorbs odors...not an antimicrobial or chemical odor masking agent. Formulated into a liquid, easy to handle, alcohol soluble or aqueous surfactant dispersible solution, the Flexicare ZR-LT active component is a zinc salt of ricinoleic acid, derived from zinc and a purified fatty acid from naturally renewable castor oil. Castor oil is obtained by the cold pressing of seeds of the *Ricinus communis* plant followed by clarification of the oil by heat. Often questioned, castor oil does not contain ricin because ricin is water soluble and does not dissolve in the oil obtained from the castor seeds. Purified castor oil is then naturally split into ricinoleic acid and glycerin for additional purification.

The derived ricinoleic acid and its zinc salts are CIR reviewed (Cosmetic Ingredient Review expert panel) and regarded for use as safe, non-toxic ingredients in a wide range of cosmetics and toiletries, and are FDA listed as Indirect Additives Used in Food Contact Substances (21 CFR §175.300).

Flexicare ZR-LT: Effective Odor Neutralization

The mechanism for odor fixation by Flexicare ZR-LT is complicated, being a combination of adsorption, complex formation, and in some instances a chemical formation such as mercaptans to mercaptides. More effective than related copper and magnesium salts of the same valence, and related stearic and oleic acids of the same carbon number, Flexicare ZR-LT zinc ricinoleate forms a unique fixating complex specific to the odor causing substances that cause intensive odor with low odor thresholds such as low molecular weight organic acids, amines, mercaptans, dialkyl sulfides, dialkyl disulfides, NH_3, H_2S, and SO_2.

When formulated into Personal Care deodorant products, zinc ricinoleate does not block pores or inhibit normal perspiration, and not being antimicrobial or antifungal, it will not interfere with the natural flora of the skin. Instead, zinc ricinoleate 'traps' the odor causing molecules produced by bacterial decomposition, such as TMHA (*trans*-3-methyl-2-hexenoic acid), in sweat so that they cannot be released with their characteristic sweaty smells.

Flexicare ZR-LT: Range of Application

Flexicare ZR-LT substances with low odor thresholds with sulfur- such as thiols and thioethers, or nitrogen-containing functional groups such as ammonia and dimethylamine, low molecular weight carboxylic acids such as isovaleric acid and hexenoic acid are effectively neutralized by ZR-LT. Flexicare ZR-LT is effective against a wide range of odorous compounds, including food and animal decomposition products such as putrescine and cadaverine, and industrial by-products such as hydrogen sulfide and sulfur dioxide and others are effectively controlled by Flexicare ZR-LT and formulations that contain it.