

VELAFRESH™ ZP

Protect the skin's microbiome with a natural solution for malodor control

- Proven to be effective against odor-causing molecules
- Leaves no stains or residues on skin or fabric
- Ease of use in finished formulations
- Will not interfere with natural perspiration
- Allows for fragrance-free claims
- Allows for all-natural claims in finished products

Effective Odor Neutralization

VELAFRESH™ ZP is a major advance in odor neutralization. Zinc complexes are widely used to neutralize odors caused by sulfides, mercaptans, amines, ammonia and body odor related molecules such as isovaleric acid and butyric acid.

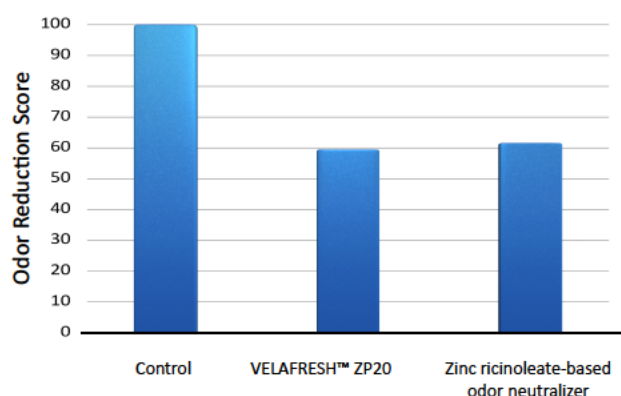
VELAFRESH™ ZP is a new, easier-to-use approach to formulating zinc complexes into personal care products.

VELAFRESH™ ZP binds volatile malodor molecules so they cannot be detected by the human nose. The technology has no substantive interference with natural perspiration. **VELAFRESH™ ZP** does not cause skin sensitization or irritation.

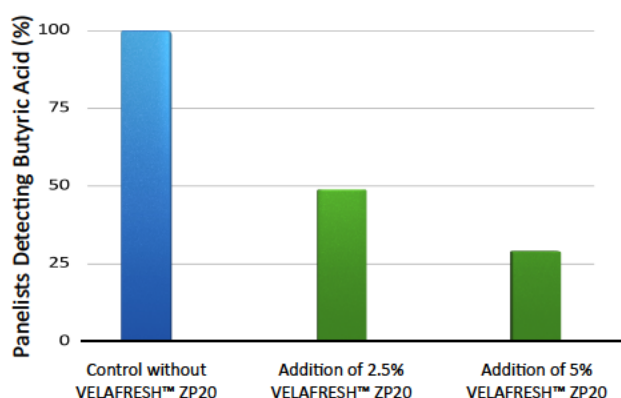
	Odor	Chemistry
✓	Spicy	3-hydroxy-3-methyl-hexanoic acid
✓	Musky	3-hydroxy-2-hexanoic acid
✓	Onion-like	3-methyl-3-sulfanylhexan-1-ol
✓	Sweaty	Isovaleric acid
✓	Cheesy	Butyric acid
✓	Hair Treatment	Ammonia
✓	Perm smell	Ammonium Thioglycolate
✓	Foot odor	Propanoic acid
✓	Foot odor	Methanethiol

Comparison of Efficacy of Zinc Based Technologies on Body Odor

Lower Score Indicates Better Odor Removal



Reduction of Butyric Acid Odor by VELAFRESH™ ZP20



High Efficacy Comparable to Current Technology

Independent laboratory testing confirms that **VELAFRESH™ ZP** performs equal to or better than the current leading zinc-based technology at neutralizing food odors and body odor. When applied at equal active zinc concentration on fabric, an expert panel found equal odor reduction for **VELAFRESH™ ZP** and Zinc Ricinoleate.

Excellent Dose Response

A number of different types of bacteria reside on the surface of the skin, some of which release enzymes that break down lipids into smaller fatty acids such as butyric acid. This molecule has an extremely pungent smell and odor threshold of just 0.001 ppm. A panel test of untrained volunteers confirmed that for a given quantity of butyric acid, the addition of **VELAFRESH™ ZP** neutralizes the observable odor and increasing the concentration of **VELAFRESH™ ZP** further reduces the amount detectable.

No Residue on Fabric or Skin

Alternative zinc-based technologies for controlling odor can leave oily stains or waxy residues on clothing as shown in pictures to the right.

VELAFRESH™ ZP technology is based on 100% water soluble polymer technology that does readily redissolve in water leaving no residue on fabric or skin. **VELAFRESH™ ZP** offers a unique approach to formulating deodorants. In solid stick, roll-on or spray formats, **VELAFRESH™ ZP** leaves no visible marks should the product come into contact with clothing during application. There are no unpleasant smells upon rewetting of fabric.



Zinc Ricinoleate
Based Ingredient

*Enhanced image for
better contrast

VELAFRESH™ ZP20

*Enhanced image for
better contrast



Ease Of Use

Due to its high-water solubility, **VELAFRESH™ ZP** binds malodors at the source. No surfactants are added to the product or needed in end-use formulations.

No need for:

- Surfactants
- Emulsifiers or Solubilizers

Compatible with:

- Leading non-ionic and anionic surfactants
- Fragrances
- Aqueous ethanol systems up to 20%

ZP20 & ZP30 Are Equally Effective

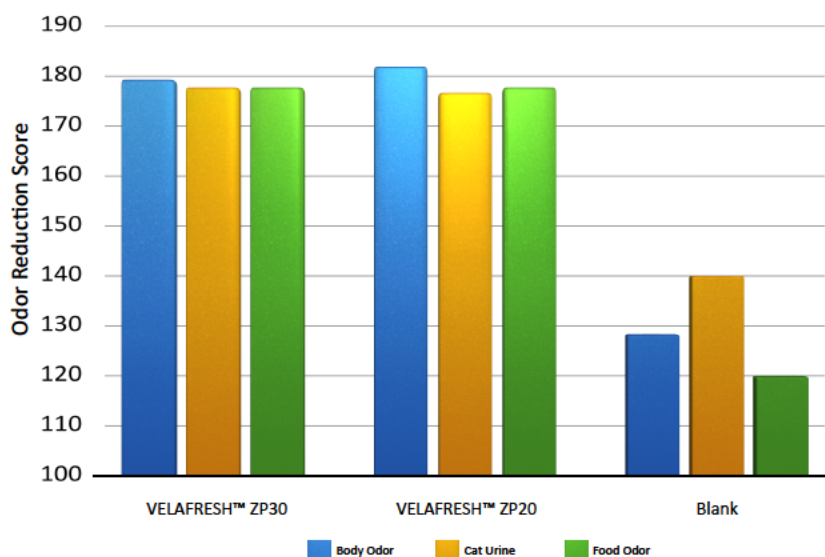
VELAFRESH™ ZP20 and **VELAFRESH™ ZP30** are both aqueous solutions of a polymeric zinc complex. Both products offer the same benefits from ease-of-use and lack of residual deposits. The primary differences between the two products are the level of active zinc, the preservative systems, and a slight difference in bio-based content.

VELAFRESH™ ZP20 has 2% active zinc. **VELAFRESH™ ZP30** offers more concentrated odor neutralization with 3.5% active zinc. Independent laboratory testing confirms that each has comparable performance at equivalent levels of active zinc.

With both products offering similar key benefits and having excellent efficacy, selecting the best one depends on the specific composition and objectives of an end-product formulation.

Odor Reduction Efficacy at Same Active Zinc Levels

Higher Score Indicates Better Neutralization



VELAFRESH™ ZP20 and ZP30

Property	Itaconix® VELAFRESH™ ZP20	Itaconix® VELAFRESH™ ZP30
Chemical nature	poly(itaconic acid), Na, K, Zn salt	poly(itaconic acid- co- AMPS), Na, Zn salt
CAS #	1662663-05-9	2220235-78-7
Active zinc	2.0%	3.5%
Biobased content	100%	85%
pH	7.9	5.8
pH adjusted with	Potassium hydroxide	Citric acid
Odor	None	Faint, sweet
Avg. molecular weight (Mw)	4750 g/mol	4300 g/mol
Appearance	clear to slightly hazy yellow liquid	clear to slightly hazy yellow liquid
Viscosity	< 100 cP	< 500 cP
Specific gravity	1.17	1.20
Solid content	26.0%	30.5%
Recommended use	1.0 – 6.0 %	0.5- 4.0 %
Preservative	Pentylene Glycol & Phenylpropanol	Potassium Sorbate (food grade)