

# ZIRKONAL® L435G

## Antiperspirant Active

INCI Name: Aluminum Zirconium Tetrachlorohydrate Gly

Empirical Formula:  $Al_4Zr(OH)_{12}Cl_4 Gly \cdot nH_2O$

### Description

ZIRKONAL® L435G is an antiperspirant active, providing enhanced efficacy over Aluminium Chlorohydrates due to the precipitation of basic Aluminium Zirconium Chlorohydrate polymer complexes in the upper part of the sweat glands. A typical HPLC trace can be seen below, indicating the characteristic polymer distribution of Aluminium Zirconium Tetrachlorohydrate Gly.

### Chemical Properties

ZIRKONAL® powders are stable under anhydrous conditions. Aqueous / alcoholic solutions of ZIRKONAL® are slightly acidic. At pH values > 5, insoluble Al/Zr Hydroxides precipitate out. On drying, the residue decomposes to HCl and Hydroxides. On further heating, to temperatures >100°C, the Hydroxides release water.

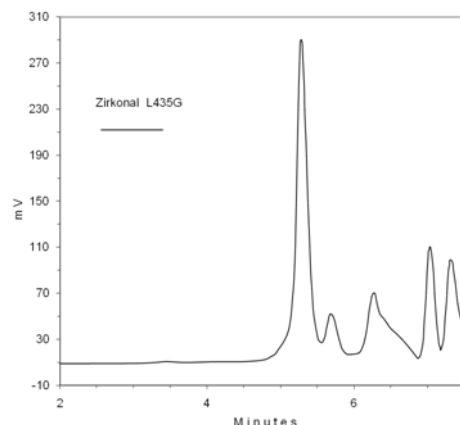
### Physiological Properties

According to the application area and concentration applied, ZIRKONAL® exhibits sweat reducing, deodorant, astringent, antibacterial and antiphlogistic properties.

### Application

ZIRKONAL® L435G is primarily used in aqueous, aqueous/alcoholic or emulsion formulations, e.g. roll-ons and creams, where maximum antiperspirant efficacy is required.

According to the FDA guidelines, only non-aerosol dosage forms are allowed. The maximum permitted concentration of ZIRKONAL® L435G is 20 %, calculated on an anhydrous basis, omitting from the calculation any buffer component present in the compound.



### General Data

Form	~ 35% solution
Aluminium	5,0 - 5,7 %
Zirconium	4,4 - 5,7 %
Chloride	5,9 - 6,7 %
Glycine	3,6 - 4,7 %
Iron	max. 50 ppm
Heavy metals [as Pb]	max. 10 ppm
pH [15 % solution]	3,7 - 4,2



Raw Materials/ Trade name	INCI name	w/w [%]
<b>A.</b> Ethanol	SD Alcohol 39-C	30,00
<b>Zirkonal® L435G (1)</b>	Aluminum Zirconium Tetrachlorohydrate Gly	37,50
Demin. water	water	29,80
Natrosol 250 HHR (5)	Hydroxyethylcellulose	0,30
<b>B.</b> Perfume Oil	Fragrance	0,80
Cremophor CO 455 (6)	PEG-40 Hydrogenated Castor Oil (and) Pro- pylene Glycol	1,60

## Antiperspirant Roll On A 59

### Procedure

**Part A:** Dissolve Natrosol 250 HHR, under high speed agitation, in water. Stir until material is completely dissolved. Add ethyl alcohol and **Zirkonal®** under stirring.

**Part B:** Mix Cremophor CO 455 and perfume oil: Add part B to part A and stir well.

### Suppliers

- 1) BK Giulini
- 5) Aqualon/Hercules
- 6) BASF

### Safety

ZIRKONAL® L435G is an Aluminium Zirconium Tetrachlorohydrate Gly according to USP 32. The FDA Final Antiperspirant Monograph classifies ZIRKONAL® types under category 1, as safe and effective for use in non-aerosol, antiperspirant formulations.

### Packaging

ZIRKONAL® L435G (35% solution) is available in 150 kg net PE drums or in 1000 kg containers.

### Storage

ZIRKONAL® types can be stored for more than 3 years in original, unopened containers. Once opened, ZIRKONAL® powder should be used quickly and contact with moisture should be avoided. ZIRKONAL® solution should be protected from freezing and storage at high temperatures should be avoided.

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