

# ZIRKONAL® P4G

## Antiperspirant Active

INCI Name: Aluminum Zirconium Tetrachlorohydrate Gly

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

### Description

ZIRKONAL® type P4G 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.

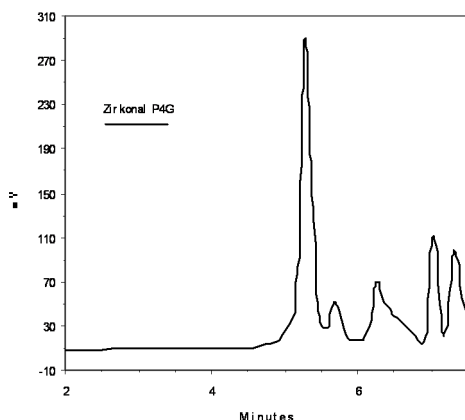
### Physiological Properties

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

### Application

ZIRKONAL® P4G is primarily used in suspension formulations e.g. sticks, suspension roll-ons, soft solids and creams.

According to the FDA guidelines, only non-aerosol dosage forms are allowed. The maximum permitted concentration of ZIRKONAL® P4G is 20 %, calculated on an anhydrous basis, omitting from the calculation any buffer component present in the compound.



### General Data

Form	fine powder
Aluminium	14,5 - 15,5 %
Zirconium	13,0 - 15,5 %
Chloride	17,0 - 18,5 %
Glycine	10,5 - 13,5 %
Iron	max. 100 ppm
Heavy metals [as Pb]	max. 20 ppm
pH [15 % solution]	3,5 - 4,5
Particle Size	98,5 % < 45 µm



Raw Materials/ Trade name	INCI name	w/w [%]
DC 345 Fluid(2)	Cyclopentasiloxane (and) Cyclohexasiloxane	34,50
Arlacel 165 (3)	Glyceryl Stearate (and) PEG-100 Stearate	1,00
Lanette 18 (4)	Stearyl Alcohol	19,00
Polyethylen- glycol 4000	PEG - 75	5,00
<b>Zirkonal® P4G (1)</b>	Aluminum Zirconium Tetrachlorohydrate Gly	20,00
Cutina HR (4)	Hydrogenated Castor Oil	0,50
<b>Gilugel® SIL 5 (1)</b>	Cyclopentasiloxane (and) Cyclohexasiloxane (and) Aluminum/Magnesium Hydroxide Stearate	20,00

## Antiperspirant Stick A 58

### Procedure

Combine the Arlacel, Lanette, PEG and Cutina, heat to 80 °C and mix well. Add the **Gilugel®** under agitation. When a homogeneous gel is formed, add the **Zirkonal®** under shear and cool to 65 °C. When the dispersion is uniform, add the volatile Silicone, cool to 55 °C and fill into containers. Stir continuously during the filling operation.

### Suppliers

- 1) BK Giulini
- 2) Dow Corning
- 3) Uniquema
- 4) Cognis

### Safety

ZIRKONAL® P4G 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® P4G powder is available in 120 kg PE drums.

### 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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