



Edition: BP 2025 (Ph. Eur. 11.6 update)

Betamethasone and Clioquinol Ointment

[General Notices](#)

Action and use

Glucocorticoid.

DEFINITION

Betamethasone and Clioquinol Ointment contains Betamethasone Valerate and Clioquinol, the latter in [very fine powder](#), in a suitable basis.

The ointment complies with the requirements stated under Topical Semi-solid Preparations and with the following requirements.

Content of betamethasone, $C_{22}H_{29}FO_5$

90.0 to 110.0% of the stated amount.

Content of clioquinol, C_9H_5ClINO

90.0 to 110.0% of the stated amount.

IDENTIFICATION

A. Carry out the method for [thin-layer chromatography, Appendix III A](#), using the following solutions.

- (1) Disperse a quantity of the ointment containing the equivalent of 1 mg of betamethasone with 10 mL of [methanol](#) by heating on a water bath until the methanol begins to boil. Shake vigorously, cool in ice and filter. Evaporate the filtrate to dryness in a current of nitrogen and dissolve the residue in 0.5 mL of [chloroform](#).
- (2) 0.24% w/v of [betamethasone valerate BPCRS](#) in [chloroform](#).

CHROMATOGRAPHIC CONDITIONS

- (a) Use as the coating [silica gel G](#).
- (b) Use the mobile phase as described below.
- (c) Apply 10 μ L of each solution.
- (d) Develop the plate to 15 cm.
- (e) After removal of the plate, allow it to dry in air, heat at 105° for 5 minutes and spray while hot with [alkaline tetrazolium blue solution](#).

MOBILE PHASE

5 volumes of [absolute ethanol](#), 10 volumes of [acetone](#) and 100 volumes of [chloroform](#).

CONFIRMATION

The principal spot in the chromatogram obtained with solution (1) corresponds in position and colour to that in the chromatogram obtained with solution (2).

- B. In the Assay for betamethasone the chromatogram obtained with solution (2) shows a peak with the same retention time as the peak due to betamethasone valerate in the chromatogram obtained with solution (3).
- C. In the Assay for clioquinol the chromatogram obtained with solution (1) shows a peak with the same retention time as the peak due to clioquinol in the chromatogram obtained with solution (2).

ASSAY

For *betamethasone*

Carry out the method for [liquid chromatography, Appendix III D](#), using the following solutions.

- (1) Disperse a quantity of the ointment containing the equivalent of 2 mg of betamethasone in 100 mL of hot [hexane](#), cool, extract with 20 mL of [ethanol](#) (65%) and filter the lower, ethanolic layer through absorbent cotton previously washed with [ethanol](#) (65%); repeat the extraction of the hexane mixture with two 10-mL quantities of [ethanol](#) (65%), filtering each extract in turn through the absorbent cotton. To the combined extracts, add 5 mL of a 0.072% w/v solution of [beclometasone dipropionate BPCRS](#) (internal standard) in [ethanol](#) (65%) and dilute the combined filtrates to 50 mL with [ethanol](#) (65%).
- (2) Prepare in the same manner as solution (1) but do not add the internal standard before diluting to 50 mL.
- (3) Mix 10 mL of a solution containing 0.024% w/v of [betamethasone valerate BPCRS](#) and 0.0012% w/v of [betamethasone 21-valerate BPCRS](#) in [ethanol](#) (65%) with 5 mL of a 0.072% w/v solution of [beclometasone dipropionate BPCRS](#) (internal standard) in [ethanol](#) (65%) and dilute to 50 mL with [ethanol](#) (65%).

CHROMATOGRAPHIC CONDITIONS

- (a) Use a stainless steel column (10 cm × 5 mm) packed with [octadecylsilyl silica gel for chromatography](#) (5 µm) (Spherisorb ODS 1 is suitable).
- (b) Use isocratic elution and the mobile phase described below.
- (c) Use a flow rate of 2 mL per minute.
- (d) Use a column temperature of 60°C.
- (e) Use a detection wavelength of 238 nm.
- (f) Inject 20 µL of each solution.

MOBILE PHASE

A mixture of [absolute ethanol](#) and [water](#) adjusted so that the [resolution factor](#) between the peaks due to betamethasone valerate (retention time about 5 minutes) and betamethasone 21-valerate (retention time about 7 minutes) is greater than 1.0 (a mixture of 42 volumes of [absolute ethanol](#) and 58 volumes of [water](#) is usually suitable).

SYSTEM SUITABILITY

The test is not valid unless, in the chromatogram obtained with solution (3), the [resolution factor](#) between the peaks due to betamethasone valerate and betamethasone 21-valerate is greater than 1.0.

DETERMINATION OF CONTENT

Calculate the content of $C_{22}H_{29}FO_5$ in the ointment using the declared content of $C_{22}H_{29}FO_5$ in [betamethasone valerate BPCRS](#) and using peak areas.

For *clioquinol*

Carry out the method for [liquid chromatography, Appendix III D](#), using the following solutions.

- (1) Add 80 mL of a hot 80% v/v solution of [2-methoxyethanol](#) to a quantity of the cream containing 30 mg of Clioquinol and heat on a water bath for 5 minutes, swirling vigorously. Cool to room temperature, dilute to 100 mL with the same solvent, mix and filter. To 5 mL of the filtrate add 1 mL of a solution containing 1% w/v of [nickel\(II\) chloride hexahydrate](#) and dilute to 50 mL with the mobile phase.
- (2) Mix 5 mL of a solution containing 0.024% w/v of [clioquinol BPCRS](#) in an 80% v/v solution of [2-methoxyethanol](#) and 1 mL of a solution containing 1% w/v of [nickel\(II\) chloride hexahydrate](#) in [water](#) and dilute to 50 mL with the mobile phase.

CHROMATOGRAPHIC CONDITIONS

- (a) Use a stainless steel column (25 cm × 4.6 mm) packed with particles of silica, the surface of which has been modified with chemically bonded phenyl groups (5 µm) (Spherisorb Phenyl is suitable).
- (b) Use isocratic elution and the mobile phase described below.
- (c) Use a flow rate of 1.5 mL per minute.
- (d) Use ambient column temperature.
- (e) Use a detection wavelength of 273 nm.
- (f) Inject 20 µL of each solution.

MOBILE PHASE

A solution containing 0.024% w/v of *nickel(II) chloride hexahydrate* in a mixture of 2 volumes of [methanol](#), 3 volumes of [acetonitrile](#) and 5 volumes of [water](#).

DETERMINATION OF CONTENT

Calculate the content of C₉H₅ClINO in the cream using the declared content of C₉H₅ClINO in [clioquinol BPCRS](#).

STORAGE

Betamethasone and Clioquinol Ointment should be protected from light.

LABELLING

The quantity of active ingredient with respect to Betamethasone Valerate is stated in terms of the equivalent amount of betamethasone.