



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

## Vancomycin Capsules

### [General Notices](#)

#### Action and use

Glycopeptide antibacterial.

### DEFINITION

Vancomycin Capsules contain Vancomycin Hydrochloride.

*The capsules comply with the requirements stated under [Capsules](#) and with the following requirements.*

### IDENTIFICATION

A. In the test for Related substances and vancomycin B, record the UV spectrum of the principal peak in the chromatograms obtained with solutions (1) and (2) with a diode array detector in the range of 210 to 400 nm.

The UV spectrum of the principal peak in the chromatogram obtained with solution (1) is concordant with that of the peak in the chromatogram obtained with solution (2);

the retention time of the principal peak in the chromatogram obtained with solution (1) is similar to that of the peak in the chromatogram obtained with solution (2).

B. The contents of the capsules yield reaction A characteristic of *chlorides*, [Appendix VI](#).

### TESTS

#### Dissolution

Comply with the requirements in the [dissolution test for tablets and capsules](#), [Appendix XII B1](#).

#### TEST CONDITIONS

- (a) Use Apparatus 1, rotating the basket at 100 revolutions per minute.
- (b) Use 900 mL of [water](#), at a temperature of 37°, as the dissolution medium.

#### PROCEDURE

After 45 minutes withdraw a sample of the medium and filter. Dilute to 100 IU/mL with [water](#), if necessary, and carry out the [microbiological assay of antibiotics](#), [Appendix XIV A](#).

#### LIMITS

The amount of vancomycin released is not less than 85% (Q) of the stated amount.

#### Related substances and vancomycin B

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

- (1) Shake a quantity of the capsule contents containing 0.1 g of Vancomycin Hydrochloride with 20 mL of [water](#), dilute to 25 mL and filter.
- (2) 0.4% w/v of [vancomycin for system suitability EPCRS](#).
- (3) Expose 4 mg of [vancomycin for system suitability EPCRS](#) to 80-100% relative humidity at  $42 \pm 2^\circ$  for at least 7 days. Allow to cool. Add 1 mL of [water](#) and dissolve the sample with the aid of ultrasound (generation of impurities B, D, E, G, and L).
- (4) Dilute 1 volume of solution (2) to 100 volumes with 0.1% v/v of [acetic acid](#). Dilute 1 volume of this solution to 10 volumes with the same solvent.

#### CHROMATOGRAPHIC CONDITIONS

- (a) Use a stainless steel column (15 cm  $\times$  2.1 mm) packed with [end-capped, charged-surface, ethylene-bridged, octadecylsilyl silica gel for chromatography \(hybrid material\)](#) (1.7  $\mu$ m) (Acquity CSH C18 is suitable).
- (b) Use gradient elution and the mobile phase described below.
- (c) Use a flow rate of 0.3 mL per minute.
- (d) Use a column temperature of  $40^\circ$ .
- (e) Use a detection wavelength of 280 nm.
- (f) Use an autosampler temperature of  $5^\circ$ .
- (g) Inject 2  $\mu$ L of each solution.

#### MOBILE PHASE

**Solution A** 0.7% w/v solution of [tris\(hydroxymethyl\)aminomethane](#) previously adjusted to pH 8.1 with a 20% v/v solution of [glacial acetic acid](#).

**Mobile phase A** 3 volumes of [acetonitrile](#), 4 volumes of [methanol](#) and 93 volumes of solution A.

**Mobile phase B** 10 volumes of [acetonitrile](#), 40 volumes of [methanol](#) and 50 volumes of solution A.

Time (Minutes)	Mobile phase A (% v/v)	Mobile phase B (% v/v)	Comment
0-7	88	12	isocratic
7-21	88→75	12→25	linear gradient
21-35	75→25	25→75	linear gradient
35-37	25	75	isocratic
37-38	25→88	75→12	linear gradient
38-45	88	12	re-equilibration

When the chromatograms are recorded under the prescribed conditions the retention times relative to vancomycin B (retention time, about 19 minutes) are: impurity E, about 0.4; impurity L, about 0.66; impurity B, about 0.70; impurity A, about 0.76; impurity F, about 0.82; impurity G, about 0.90; impurity H, about 0.94; impurity M, about 1.11; impurity I, about 1.14; impurity J, about 1.20; impurity D, about 1.24; impurity K, about 1.5 and impurity C, about 1.9.

#### SYSTEM SUITABILITY

The test is not valid unless, in the chromatogram obtained with solution (3):

the [resolution](#) between the peaks due to impurity L and impurity B is between 1.5 to 5.0;

the [resolution](#) between the peaks due to impurity G and impurity H is between 1.5 to 4.0.

If the [resolution](#) between the peaks due to impurities L and B is greater than 5.0, adjust the pH of solution A to a lower value. If the [resolution](#) between the peaks due to impurities G and H is greater than 4.0, adjust the pH of solution A to a higher value.

#### LIMITS

Identify any peaks in the chromatogram obtained with solution (1) corresponding to vancomycin impurities A, C, F, H, I, J, K and M using the chromatogram obtained with solution (2) and any peaks corresponding to vancomycin impurities B, D, E, G, and L using the chromatogram obtained with solution (3).

In the chromatogram obtained with solution (1), integrate all peaks present with an area greater than the area of the principal peak in the chromatogram obtained with solution (4) to determine the total peak area. Calculate the percentage content of each of the components and impurities by *normalisation*:

the content of vancomycin B is not less than 81.0%;

the area of any peak due to impurities G or J is not greater than 3.2%;

the area of any peak due to impurities A, D or H is not greater than 3.0%;

the area of any peak due to impurity L is not greater than 2.1%;

the sum of the areas of any peaks due to impurities B and E is not greater than 2.0%;

the area of any peak due to impurity C is not greater than 2.0%;

the area of any peak due to impurity I is not greater than 1.8%;

the area of any peak due to impurities F or M is not greater than 1.5%;

the area of any peak due to impurity K is not greater than 1.2%;

the area of any other [secondary peak](#) is not greater than 0.8%;

the sum of the areas of all the [secondary peaks](#) is not greater than 19.0%.

## ASSAY

Weigh and mix the contents of 20 capsules. Dissolve a quantity of the mixed contents containing 1,000,000 IU of vancomycin as completely as possible in sufficient [water](#) to produce 1000 mL. Dilute 10 mL to 100 mL and carry out the [microbiological assay of antibiotics](#), [Appendix XIV A](#). The precision of the assay is such that the fiducial limits of error are not less than 95% and not more than 105% of the estimated potency.

The upper fiducial limit of error is not less than 90.0% and the lower fiducial limit of error is not more than 110.0% of the stated number of IU.

## LABELLING

The label of the sealed container states (1) the total number of IU (Units) contained in it; (2) the number of IU (Units) per mg in each capsule.

## IMPURITIES

The impurities limited by the requirements of this monograph include those listed under Vancomycin Hydrochloride.