

## Certificate of Analysis Reference Material

Lipomed Document QC-CA-1568

Version: 003-04.Aug.2023

Supersedes: 002-03.May.2019

**Chemical Name:** **Clenbuterol.HCl**  
(RS)-1-(4-Amino-3,5-dichlorophenyl)-2-(tert-butylamino)ethanol  
.hydrochloride

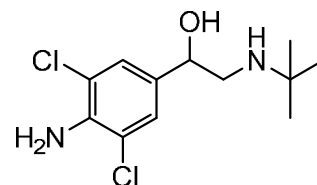
**Lot No:** 1568.1B0.1  
**Art. No:** CBT-1568-HC

**Release Date:** July 21, 2023  
**Last Testing Date:** N/A  
**Retest Date:** **July 2033**

**Chemical Formula:**  $C_{12}H_{18}Cl_2N_2O$   
Hydrochloride

**Molwt:** 277.19  
313.65

**CAS Registry No:** 21898-19-1



TEST	SPECIFICATION	RESULT
1. Appearance	white to off-white crystalline powder	conforms
2. Purity	HPLC > 98.5 % The purity is calculated from the distribution of 6 HPLC analyses with a 95% level of confidence.	99.9451 ± 0.0014 %
3. Free Base Content (Corrected from purity and water)	> 86.1 %	87.7 %
4. Optical Rotation	N/A (racemic mixture)	N/A
5. Water Content	Karl Fischer ≤ 1.0 %	0.6 %
6. Calculated Hydrochloride Content		11.6 %

**Storage Conditions:** For maximum stability store air-tight at 2 - 8°C in a dark location.

Lipomed certifies that this standard meets the specifications stated in this certificate and warrants this product to meet the stated acceptance criteria through the retest date when stored unopened as recommended.

**FOR ANALYTICAL PURPOSES ONLY: NOT FOR HUMAN OR ANIMAL USE!**

Issued by Dr. L. Prévot

Date sign: Arlesheim,

**August 04, 2023**

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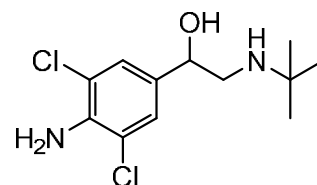
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TEST	SPECIFICATION	RESULT
7. Identity	IR	IR corresponds
	UV: in methanol	UV: in methanol
	$\lambda_{\max,1} = 211.0 \pm 1.0 \text{ nm}$	$\lambda_{\max,1} = 210.7 \text{ nm}$
	$\epsilon_{\text{mol},1} = 38000 \pm 4000$	$\epsilon_{\text{mol},1} = 38303$
	$\lambda_{\max,2} = 246.0 \pm 1.0 \text{ nm}$	$\lambda_{\max,2} = 246.5 \text{ nm}$
	$\epsilon_{\text{mol},2} = 10000 \pm 1000$	$\epsilon_{\text{mol},2} = 10249$
	Mass Spectroscopy (ESI <sup>+</sup> )	MH <sup>+</sup> corresponds

## GENERAL INFORMATION

### Quality Documentation:

This certificate is designed in accordance with ISO Guide 31 (Reference Materials – Contents of Certificates and Labels) and ISO Guide 35 (Reference Materials – General and Statistical Principles for Certification).

### Quality Standards for Arlesheim Production Site:

- |                      |  |
|----------------------|--|
| <b>ISO 9001</b>      | Quality Management System. Manufacturing, analysis, packaging and distribution of Analytical Reference Materials and Pharmaceuticals. IQNet/SQS Certification: 37199 |
| <b>ISO/IEC 17025</b> | General requirements for the competence of Testing Analytical Reference Standards. ANAB Certificate number: AT-1760  |
| <b>ISO 17034</b>     | General requirements for the competence of Reference Material Producer. ANAB Certificate number: AR-1761   |

### Quality Control Assessment:

The product quality is controlled by regularly performed quality control tests (retests).

### Intended Use:

The product covered by this certificate is designed for calibration or for use in quality control procedures for the specified chemical compound listed page 1. This product can be used for quantification and/or identification. If dilution is required use only diluent compatible with all certified analyses in this preparation. All solutions should be thoroughly mixed prior to use.

### Expiration/Retest dates:

Expiration date/Retest date of the unopened flask stored at the recommended storage condition is the last day of the month listed page 1.

A retest will be performed 6 months prior to the stated retest date. Upon successful retesting, a new retest date or expiration date is set for the product. The certificate of analysis is then updated and made available on our website. For our products, the extension of the shelf life is capped to 10 years after release as the maximum period.

### Gravimetric preparation:

All balances are calibrated annually by an ISO/IEC 17025 accredited calibration service. Calibration verification is performed weekly with certified traceable weights. Each balance has been assigned a minimum weighing.

### Purity:

- Purity and/or chemical identity are determined by one or more of the following techniques: HPLC/UV, GC/FID, LC/MS, IR, UV, <sup>1</sup>H NMR, Karl Fischer, melting point and optical rotation if applicable
- Purity of isomeric compounds is reported as the sum of the isomers
- Purity values are rounded to the last decimal place given

### Uncertainty Statistics and Confidence limits:

The uncertainties are determined in accordance with ISO 17034 and ISO/IEC 17025. Uncertainty is given for a minimum injection volume of 1 µl. The certified uncertainty value (including characterization uncertainty, homogeneity between ampoules uncertainty, storage stability uncertainty and shipping stability uncertainty) is combined using the following formula:

$$U(y) = \sqrt{U_{\text{characterization}}^2 + U_{\text{homogeneity}}^2 + U_{\text{storage stability}}^2 + U_{\text{shipping stability}}^2}$$

The packaged amount is the minimum sample size for which uncertainty is valid.

### Stability:

The manufacturer guarantees the stability of this product throughout its intended shelf life, when handled and stored accordingly to the given storage conditions.

### Legal and Safety Notice:

This product is for routine laboratory analysis and research purposes only. Due to the hazardous nature, only trained personnel should handle this product. The General Terms and Conditions of Lipomed apply.