



100 Majestic Way, Bangor, PA 18013 / www.biospectra.us

|                      |  |                    |                       |
|----------------------|--|--------------------|-----------------------|
| Effective Date:      | 07-Jun-2023                            | 07-Jun-2026        | : Date of Next Review |
| Prepared By:         | Virginia Pena                          | BSI-COA-0131 v.6.1 | : Supersedes          |
| QA/QC Approval:      | Carissa Albert                         | Amy Yencho         | : Management Approval |
| Reason for Revision: | See Revision History in MasterControl. |                    |                       |

**CERTIFICATE OF ANALYSIS**  
**L-CYSTINE diHCl**  
**BIO PHARMA GRADE / LCYS-4250-10**  
**LOT: LCYS-0123-00031**

$C_6H_{12}N_2O_4S_2 \cdot 2HCl$  \* F.W. 313.22 g/mol. \* CAS# 30925-07-6

Retest Date: 4/16/25

Manufacturing/Packaging Date: 6/22/23 Packaging Site: 100 Majestic Way, Bangor PA, 18013

| ANALYSIS                              | SPECIFICATION                                  | TEST RESULT               |
|---------------------------------------|--|---------------------------|
| Appearance and Color                  | White to Slightly Yellow<br>Crystalline Powder | White crystalline powder. |
| Assay (Dried Basis)                   | 98.0% - 102.0%                                 | 99.46 %                   |
| Bioburden                             | ≤ 100 CFU/g                                    | 05 CFU/g                  |
| Chloride                              | 22.2% - 23.5%                                  | 22.52 %                   |
| Endotoxin                             | <0.02 EU/mg                                    | Complies                  |
| Heavy Metals (Pb)                     | <10 ppm  | 1.033 ppm                 |
| Identification (IR Spectrum)          | Passes Test                                    | Complies                  |
| Loss on Drying @ 105°C                | ≤ 0.5%   | 0.19 %                    |
| pH (0.1% soln.)                       | Report   | 2.36                      |
| Residue on Ignition                   | ≤ 0.1%   | 0.06%                     |
| Specific Rotation (Free Basis) @ 20°C | -225.0° to -215.0°                             | -220.80°                  |
| Solubility                            | Passes Test                                    | Complies                  |

COUNTRY OF ORIGIN: India

TEST RESULTS: Test Results are obtained from the approved supplier's certificate of analysis.

INTENDED USE: Material represented by this Certificate of Analysis is suitable for use as a process chemical. It is GMP manufactured by the approved supplier in accordance with the approved supplier's ISO 9001:2015 certified management system. The material represented by this Certificate of Analysis is not suitable to be used as an Active Pharmaceutical Ingredient, Drug, Drug Product or Household Item.

RETEST DATE: The retest date is obtained from the approved supplier's certificate of analysis.

Prepared by: David McCall Date: 6/29/23 Job Title: QA Support Tech

Reviewed by: Jim Singh Date: 6/29/23 Job Title: QA Mater. Disp. Supervisor