



Standard Test Method for Liquid Holding Capacity of Granular Carriers¹

This standard is issued under the fixed designation E 1521; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method is used to determine the liquid holding capacity (LHC) of granular carriers.

1.2 The values stated in either SI or inch-pound units are to be regarded as standard. The values given in parentheses are for information only.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* For specific precautionary statements, see Section 5.

2. Summary of Test Method

2.1 Incremental amounts of suitable fluids are added to a known weight of granular carrier. The point at which the granules stick to the sides of the container allows calculation of the LHC.

3. Significance and Use

3.1 This test method has been designed principally for granular carriers with LHC greater than 5.0%. The incremental amount of suitable fluid added can be adjusted down as needed for carriers with LHC less than 5.0%.

3.2 This test method is applicable to granules in the range from 4 to 100 mesh (4.75 to 0.150 mm).

4. Apparatus and Reagents

4.1 *Buret Stand.*

4.2 *Buret*, 10 to 25 mL, accurate to 0.2 mL.

4.3 *Glass Bottle*, 1 oz (29.6 mL), with poly seal cap (7 by 3.5-cm outside diameter).

4.4 *Glass Bottle*, 8 oz (236.8 mL), wide mouth with poly seal cap.

4.5 *Suitable Fluids*—, deodorized mixed aliphatic solvents like Exxsol(R) D110 from Exxon Mobile Chemical Company, that boil in the range of 250–275°C and have a specific gravity of 0.80–0.82

4.6 *Balance*, accurate to ± 0.1 g.

5. Safety Precautions

5.1 Before testing, read the precautionary statements on the product label and material safety data sheet. Take proper precautions to prevent skin contact and inhalation of the fines and vapors. Take care to prevent contamination of the surrounding area. Always wear the appropriate safety equipment and, where indicated, wear respiratory devices approved by NIOSH for the product being tested.

6. Procedure

6.1 Weigh 7.0 ± 0.1 g of granular carrier for LHC determination into a 29.6-mL glass bottle.

6.2 From a buret, add a suitable fluid as follows: 0.5-mL increments until 2.0 mL is reached, or the carrier meets one end point conditions. Shake between increments by hand or mechanical shaker until completely absorbed. (A few sharp taps with the heel of the hand may be necessary to break up a saturated portion.) Shaking should not exceed 2 min.

6.3 After the first 2.0 mL is added, decrease the increments to 0.2 mL and proceed as described in 6.2 until the end point is reached. The end point is indicated by two or more of the following:

6.3.1 Carrier darkens or appears wet.

6.3.2 Granules cease to be free flowing.

6.3.3 Granules stick to sides of bottle.

6.3.4 Granules stick to bottom of bottle when inverted slowly.

6.4 An alternate procedure is to use 50 g of carrier. Follow the instructions given in 6.1–6.3, but use the 236.8-mL jar. Add an initial 15 mL of fluid in 5-mL increments, as described in 6.2. Thereafter, follow the steps outlined in 6.3.

6.5 For carriers with low LHC the initial increments of fluid added may have to be adjusted down so the end points are not exceeded.

7. Calculation

7.1 Calculate % LHC as follows:

$$\% \text{ LHC} = \frac{(\text{ml fluid}) \times (\text{fluid specific gravity}) \times (100)}{(\text{g granules}) + ((\text{ml fluid}) \times (\text{fluid specific gravity}))} \quad (1)$$

7.2 Round the % LHC to the nearest whole number.

¹ This test method is under the jurisdiction of ASTM Committee E-35 on Pesticides and is the direct responsibility of Subcommittee E35.22 on Pesticide Formulation and Application Systems.

Current edition approved April 10, 2001. Published June 2001.

Originally published as E1521–92. Last previous edition E 1521–93 (1998).

8. Disposal of Sample

8.1 Store all materials in a safe manner after testing, and dispose of used material in accordance with the product label directions and material safety data sheet.

9. Keywords

9.1 formulations; granular carriers; liquid holding capacity; pesticides

The ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org).