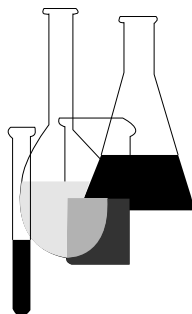




Product Properties Test Guidelines

OPPTS 830.6316 Explodability



INTRODUCTION

This guideline is one of a series of test guidelines that have been developed by the Office of Prevention, Pesticides and Toxic Substances, United States Environmental Protection Agency for use in the testing of pesticides and toxic substances, and the development of test data that must be submitted to the Agency for review under Federal regulations.

The Office of Prevention, Pesticides and Toxic Substances (OPPTS) has developed this guideline through a process of harmonization that blended the testing guidance and requirements that existed in the Office of Pollution Prevention and Toxics (OPPT) and appeared in Title 40, Chapter I, Subchapter R of the Code of Federal Regulations (CFR), the Office of Pesticide Programs (OPP) which appeared in publications of the National Technical Information Service (NTIS) and the guidelines published by the Organization for Economic Cooperation and Development (OECD).

The purpose of harmonizing these guidelines into a single set of OPPTS guidelines is to minimize variations among the testing procedures that must be performed to meet the data requirements of the U. S. Environmental Protection Agency under the Toxic Substances Control Act (15 U.S.C. 2601) and the Federal Insecticide, Fungicide and Rodenticide Act (7 U.S.C. 136, *et seq.*).

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OPPTS 830.6316 Explodability.

(a) **Scope**—(1) **Applicability.** This guideline is intended to meet testing requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 U.S.C. 136, *et seq.*).

(2) **Background.** The source material used in developing this harmonized OPPTS test guideline is OPP guideline 63–16 Explodability (Pesticide Assessment Guidelines, Subdivision D: Product Chemistry, EPA Report 540/9–82–018, October 1982) and 40 CFR 158.190 Physical and chemical characteristics.

(b) **Test method.** The recommended test methods for explodability are described in 44 FR 16265 (1979) which is reproduced, with minor changes, in paragraph (b)(2) of this guideline. Also, the test method for solids described in the Official Journal of the European Communities may be used where appropriate (see paragraph (d) of this guideline). If an alternative method is used, it is recommended that the registrant consult with the Agency prior to adopting the test method.

(1) **Objectives.** (i) Data on the physical and chemical characteristics of pesticide products are used to confirm or provide supportive information on their identity. Such data are also used in reviewing the production or formulating process used to produce the pesticide or product.

(ii) Explodability is the capability of a substance to undergo an uncontrolled, rapid, violent chemical reaction resulting in a sudden increase in pressure. The explodability test is necessary for use in precautionary labeling of pesticides when the product is potentially explosive. Knowledge about the explosion potential of chemicals is important for assessing the risk they may pose for human health. Impact explodability affects the risk of handling large quantities of chemicals (the force of a falling container is proportional to mass). Thermal explosion data could be a useful parameter for assessing the risk posed by handling or using various quantities of a chemical.

(iii) The probabilities of thermally induced explosion occurring are independent of the weight of the chemical present except as this may affect the rate of heating. Shock and thermal explodability testing is potentially applicable to all solid and liquid chemicals. The intended use of a chemical may be especially important in determining applicability of these tests.

(2) **Test details.** The thermal explodability method recommended differential thermal analysis/scanning calorimetry, (DTA/DSC), is a classic, simple chemistry technique yielding results that are easily interpreted. ASTM method E-967 is an apparatus calibration method that should be performed to assure the quality of the submitted DTA/DSC data (see paragraph (d)(4) of this guideline). The impact explodability method for solids is that recommended by the Department of Transportation and the Environmental Protection Agency (see paragraphs (d)(1) and (d)(2) of this guide-

line). The impact explosibility method for liquids is based on a critical review by the Department of Transportation (see paragraph (d)(7) of this guideline).

(i) **Thermal explosibility.** For thermal explosibility (DTA/DSC), ASTM E-487 should be used. For data recording, ASTM E-472 should be used. For calibration, ASTM E-537, ASTM E-967 should be used. (See paragraphs (d)(3), (d)(4), (d)(5), and (d)(6) of this guideline.)

(ii) **Impact explosibility.** For impact explosibility, the Bureau of Explosives impact apparatus (49 CFR 173.53, note 4) should be used for solids. Bureau of Mines or Naval Ordnance laboratory impact testers should be used for liquids.

(c) **Reporting.** (1) For thermal explosibility, a graph of $\Delta T(C)$ or ΔE cal vs. T or t (seconds or minutes) should be attached, the heating rate and calibration determination recorded, and the instrument (make and model) described. For impact explosibility, the results for the different heights and weights used should be recorded.

(2) Any methods used to characterize the physical properties of a pesticide shall be referenced or described in the application for registration. If the methods used are listed in paragraph (d) of this guideline, reference to the method will suffice. If other methods are used, copies of such methods must be submitted with the application.

(3) References that denote "ASTM" refer to standardized methods published by the American Society for Testing and Materials. Philadelphia, PA.

(4) The applicant shall submit his own statistical evaluation of the precision and accuracy of these measurements (e.g., standard deviations or confidence intervals) when appropriate.

(d) **References.** The following references should be consulted for additional background material on this test guideline.

(1) EPA, "Flammability/Explosibility," FEDERAL REGISTER, 44 FR 16265 (1979).

(2) Department of Transportation, Definition of Class A Explosives, 49 CFR 173.53, note 4, 1976.

(3) American Society for Testing and Materials, "Standard Practice for Reporting Thermoanalytical Data, E-472," ASTM, Philadelphia, PA, 1994 annual index.

(4) American Society for Testing and Materials, "Temperature Calibration of Differential Scanning Calorimeters, E-967," ASTM, Philadelphia, PA, 1994 annual index.

(5) American Society for Testing and Materials, “Standard Test Method for Constant-Temperature Stability of Chemical Materials, E-487,” ASTM, Philadelphia, PA, 1994 annual index.

(6) American Society for Testing and Materials, “Standard Test Method for Assessing the Thermal Stability of Chemicals by Methods of Differential Thermal Analysis, E-537,” ASTM, Philadelphia, PA, latest annual index.

(7) Lasseigne, A.H. *Hazard Classification of Explosives for Transportation, Evaluation of Test Methods*, Department of Transportation, Report TES-20-73-2 (1973).

(8) *Official Journal of the European Communities*, “A.14. Explosive Properties,” No L 383 A/87.