



Standard Guide for Measurement of Behavior During Fish Toxicity Tests¹

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1. Scope

1.1 This guide covers some general information on methods for qualitative and quantitative assessment of the behavioral responses of fish during standard laboratory toxicity tests to measure the sublethal effects of exposure to chemical substances. This guide is meant to be an adjunct to toxicity tests and should not interfere with those test procedures.

1.2 Behavioral toxicosis occurs when chemical or other stressful conditions, such as changes in water quality or temperature, induce a behavioral change that exceeds the normal range of variability (1). Behavior includes all of the observable, recordable, or measurable activities of a living organism and reflects genetic, neurobiological, physiological, and environmental determinants (2).

1.3 Behavioral methods can be used in biomonitoring, in the determination of no-observed-effect and lowest-observed-effect concentrations, and in the prediction of hazardous chemical impacts on natural populations (3).

1.4 The behavioral methods described in this guide include locomotory activity, feeding, and social responses, which are critical to the survival of fish (4).

1.5 This guide is arranged as follows:

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1.6 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical

conversions to SI units that are provided for information only and are not considered standard.

1.7 *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.* While some safety considerations are included in this guide, it is beyond the scope of this guide to encompass all safety requirements necessary to conduct behavioral toxicity tests. Specific hazards statements are given in Section 7.

2. Referenced Documents

2.1 ASTM Standards:²

E140 Hardness Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness

E729 Guide for Conducting Acute Toxicity Tests on Test Materials with Fishes, Macroinvertebrates, and Amphibians

E1023 Guide for Assessing the Hazard of a Material to Aquatic Organisms and Their Uses

E1241 Guide for Conducting Early Life-Stage Toxicity Tests with Fishes

E1383 Guide for Conducting Sediment Toxicity Tests with Freshwater Invertebrates³

E1604 Guide for Behavioral Testing in Aquatic Toxicology

3. Terminology

3.1 *Definitions*—The words “must,” “should,” “may,” “can,” and “might” have very specific meanings. “Must” is used to express an absolute requirement, that is, to state that the test ought to be designed to satisfy the specified condition, unless the purpose of the test requires a different design. “Must” is used only in connection with the factors that relate directly to the acceptability of the test. “Should” is used to state that the specified condition is recommended and ought to be

¹ This guide is under the jurisdiction of ASTM Committee E50 on Environmental Assessment, Risk Management and Corrective Action and is the direct responsibility of Subcommittee E50.47 on Biological Effects and Environmental Fate.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Withdrawn.