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**Water quality — Determination  
of acute toxicity of water samples  
and chemicals to a fish gill cell line  
(RTgill-W1)**

*Qualité de l'eau — Détermination de la toxicité aiguë d'échantillons  
d'eau et de produits chimiques vis-à-vis de la lignée cellulaire de  
branchies de poissons (RTgill-W1)*

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## Foreword

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Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

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## Introduction

Millions of fish are used annually to test the acute toxicity of water samples, such as effluents or chemicals. Using an alternative model of testing would not only reduce the need for animals, but would have added benefits, such as much faster testing, using smaller volumes and creating less waste. Using embryos of zebrafish prior to independent feeding has partly filled this need for alternative fish acute toxicity testing.

This document describes a procedure that assesses fish acute toxicity using a permanent fish cell line. Comparative work with both the zebrafish embryo and the cell line has shown that they are expected to yield similar results, i.e. within approximately a 10-fold range based on measured concentrations. They also have a common limitation, i.e. a limited ability to detect neurotoxic compounds. Resource needs, however, differ. For example, while the use of the cell line omits any need for fish and the time from exposure to obtaining the test results is reduced, it does require sterile culture techniques. Thus, the choice of the assay may be guided by the available resources and needs.

The fish cell line in the procedure described in this document is the RTgill-W1 cell line<sup>[1]</sup> established from rainbow trout (*Oncorhynchus mykiss*) gill. It is commercially available as ATCC® CRL-2523™<sup>1)</sup>. Two similarly structured procedures are described: one for water samples, such as effluents, and one for chemical testing.

The standards ISO 15088<sup>[2]</sup> and OECD 236<sup>[3]</sup> are also related to prediction of waste water or chemical fish acute toxicity, relying on zebrafish embryos.

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