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Water quality — Isolation and identification of *Cryptosporidium* oocysts and *Giardia* cysts from water

Qualité de l'eau — Isolement et identification des oocystes de Cryptosporidium *et des kystes de Giardia*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15553 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 4, *Microbiological methods*.

Introduction

Cryptosporidium and *Giardia* are protozoan parasites that can cause enteric illness in humans. Both organisms are characterized by an ability to survive in the aquatic environment. *Cryptosporidium* in particular is resistant to chlorine at the concentrations used in the treatment of drinking and swimming pool waters. Consequently the absence of vegetative bacteria as indicators of faecal contamination does not necessarily indicate the absence of *Cryptosporidium* oocysts or *Giardia* cysts. The methods described in this document may be used to determine whether *Cryptosporidium* and/or *Giardia* are present in water supplies. The techniques have been selected on the basis of method development and peer review publication of the data thus obtained. They are further selected to give comparable recoveries of the methods or reagents used in the isolation of the organisms.

Water quality — Isolation and identification of *Cryptosporidium* oocysts and *Giardia* cysts from water

1 Scope

This International Standard specifies a method that is applicable for the detection and enumeration of *Cryptosporidium* oocysts and *Giardia* cysts in water. It is applicable for the examination of surface and ground waters, treated waters, mineral waters, swimming pool and recreational waters.

This method does not allow identification to species level, the host species of origin or the determination of viability or infectivity of any *Cryptosporidium* oocyst or *Giardia* cyst which may be present. These procedures are for use by experienced analysts who have successfully completed competency tests prior to commencing analysis. In addition, such analysts should continue to demonstrate competency by examining seeded samples at regular intervals and taking part in external quality assurance schemes.

NOTE Bodies resembling *Cryptosporidium* or *Giardia* in morphology can be present and these may be mistaken for oocysts or cysts. Results should be interpreted with care. Where there is doubt about the identity of oocysts or cysts or where an unusually high result is obtained, it is advisable to have the slides examined by experts from other laboratories to confirm or refute the findings.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
Cryptosporidium
protozoan parasite, concentrated and selected from water samples with the methods described, which reacts with specific anti-*Cryptosporidium* antibodies and exhibits the typical morphological characteristics described in 7.4 of this International Standard

NOTE A more complete definition of the parasite and the different genotypes and species is given in Annex G.

2.2
Giardia
protozoan parasite, concentrated and selected from water samples with the methods described, which reacts with specific anti-*Giardia* antibodies and exhibits the typical morphological characteristics described in 7.4 of this International Standard

NOTE A more complete definition of the parasite and the different species is given in Annex G.

3 Principle

3.1 Concentration from water

The isolation of *Cryptosporidium* and *Giardia* from water requires the use of a procedure which allows the volume of the sample to be reduced whilst retaining any oocysts and cysts. The concentration procedure used however, is dependent upon the water type which is to be analysed, the volume of sample and the amount of particulate material in the sample. This document describes the use of two concentration techniques for varying volumes of water using cartridge filtration and elution followed by low speed centrifugation (7.1). Additional methods for the recovery of oocysts and cysts from small volumes of water or very turbid waters are given in Annex B. Some examples of recovery data for these techniques are given in Annex E.