ISO 11711-2:2022-09 (E)

Ships and marine technology - Aquatic nuisance species - Part 2: Ballast water sample collection and handling

Contents

Page

Foreword ..... **v**

Introduction ..... **vi**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **1**

4 Sample collection process **5**
4.1 General 5
4.2 Fundamental principles 6
4.2.1 General 6
4.2.2 Sample collection flow, duration, and volume 6
4.3 Preparation 7
4.3.1 General 7
4.3.2 Measurement requirements and purpose of the sample 7
4.3.3 Ship access and sampling facilities in machinery spaces 7
4.3.4 Coordination with the ship's crew 8
4.4 Maintenance of sampling apparatus 8
4.5 Quality management 8

5 Sample probe **8**
5.1 General 8
5.2 Design of the sample probe 9
5.2.1 Sample probe sizing and flow rates 9
5.2.2 Sample probe geometry 10
5.2.3 Sample probe structural design and materials 12
5.2.4 Installation and removal considerations 12
5.3 Hot-tap sample probe assembly 13
5.3.1 General 13
5.3.2 Configuration 13
5.3.3 Design criteria 14
5.3.4 Typical operations 14

6 Sample collection device **15**
6.1 Initial considerations 15
6.1.1 General 15
6.1.2 Open system 15
6.1.3 Closed system 15
6.1.4 Open loop configuration 15
6.1.5 Closed loop configuration 15
6.1.6 Concentration methods ≥50 µm (filtered samples) 16
6.1.7 Collection methods for whole water samples 16
6.1.8 Sample retrieval and rinsing 17
6.1.9 Sample volumes by size class 18
6.2 Sample collection device control system 18
6.2.1 General 18
6.2.2 Parameters monitored 19
6.3 Sample transfer piping 20

7 Handling and identification of the sample **21**
7.1 Sample handling 21
7.2 Sample identification 21
7.3 Neutralization agents 22

7.4 Filling the container 22
7.5 Sample storage 23
7.6 Chain-of-custody 23
7.7 Transport 24

Annex A (informative) **Example configurations of sample collection devices and ballast piping connections** **25**

Annex B (informative) **Shipboard sample collection worksheet** **28**

Annex C (normative) **Sample probe lookup tables** **33**

Bibliography **41**