

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 $\geq 50 \mu\text{m}$ (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	