

SRI LANKA STANDARD 799 : 1987

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TOLERANCE LIMITS FOR
FISH CULTURE

SRI LANKA STANDARDS INSTITUTION

Gr.4

SRI LANKA STANDARD
TOLERANCE LIMITS FOR INLAND SURFACE WATERS
FOR FISH CULTURE

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 1987-10-08, after the draft, finalized by the Drafting Committee on Industrial Effluents, had been approved by the Chemicals Divisional Committee.

Pollution of inland surface waters meant for fish culture, with industrial and domestic effluents, agro-chemicals and other pollutants is an important problem associated with inland fisheries. As a first step in the prevention of pollution and control of adverse effects, it is necessary to prescribe standards for the purity of waters into which effluents may be discharged, so that such receiving water courses could be safely used for fish culture.

This standard is intended essentially to help the local authorities in deciding on restrictions that may be required on the discharge of industrial and domestic effluents into inland surface waters for fish culture. Pollution of such waters beyond tolerance limits prescribed in this standard shall not be allowed.

The standard values given in this standard are in SI units.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with CS 102. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

In the preparation of this standard the assistance obtained from the publications of the World Health Organization, American Public Health Association and Indian Standards Institution is gratefully acknowledged.

1 SCOPE

This standard prescribes the tolerance limits and methods of sampling and test for inland surface waters for fish culture.

2 REFERENCES

- APHA - AWWA - WPCF Standard methods for the examination of water and waste water
- UNESCO/WHO Global environmental monitoring systems operational guide
- CS 102 Presentation of numerical values
- SLS 614 Potable water
- Part 1 : Physical and chemical requirements

3 REQUIREMENTS

Inland surface waters for fish culture shall comply, with the tolerance limits specified in Table 1.

4 SAMPLING

4.1 General requirements of sampling

4.1.1 The samples shall be collected in clean glass containers with glass stoppers or plastic containers with plastic lids. The capacity of the containers shall be at least 2.5 litres.

NOTE - The containers and the methods of preservations of samples and recommended maximum storage time are given in Appendix A of SLS 614:Part 1:1983.

4.1.2 If sampling instruments are used, they shall be cleaned and dried before use.

4.2 Drawing of samples

The bottles shall be well rinsed with the water to be sampled before being filled. As far as possible the bottles shall be filled direct from the source (without the aid of a jug or a funnel). Care should be taken to prevent any external contamination during the process of sampling. Having filled the bottle, the stopper should be rinsed with the water and inserted firmly.

4.3 Time of test

4.3.1 If the tests are not to be carried out at once at the place of sampling, the samples shall be transported to the laboratory without delay and kept cool in transit.

4.3.2 The tests shall commence as soon as possible and in any case within 48 hours of sampling unless specified in Appendix A of SLS 614:Part 1:1983.

TABLE 1 - Tolerance limits for inland surface waters
for fish culture

Determinant	Tolerance limit	Method of test (Ref. to publication in Clause 5, SLS 614 and relevant Appendix)	Technique of the method
1) pH range at ambient temperature	6.0 to 9.0	a	Electrometry, by means of a pH meter with a glass electrode (Reference method)
2) Oils and greases, mg/l, max.	0.1	b a	Colorimetry Gravimetry, liquid-liquid extraction with trichlorotrifluoro ethane
3) Dissolved oxygen (DO), mg/l, min.	3	b	Winkler (azide modification) method
4) Biochemical oxygen demand (BOD), mg/l, max.	5	b	Incubation for 5 days at 20 °C (Reference method) Incubation for 3 days at ambient temperature
5) Arsenic (as As), mg/l, max.	0.2	a	A.A. Spectrophotometric method
6) Mercury (as Hg), mg/l, max.	0.000 3	a	A.A. Spectrophotometric method
7) Phenolic compounds (as Phenolic OH), mg/l, max.	0.1	a	Colorimetry-chloroform extraction method
8) Pesticides (chlorinated hydrocarbons as Cl), mg/l, max.	0.002	a	Gas chromatography
9) Free ammonia (as N), mg/l, max.	1.2	a/b	Colorimetry-phenate method
10) Free carbon dioxide (as CO ₂), mg/l, max.	6	Appendix B of SLS 614:Part 1 Appendix A	Colorimetry-Nesslerization (Reference method) Titrimetric method
11) Electrical conductivity, µS/cm, max.	1 000	a	Conductometry (Reference method)
12) Radio active material			
a) Alpha emitters, µc/ml, max.	10 ⁻⁹	a	Proportional or scintillation counter
b) Beta emitters, µc/ml, max.	10 ⁻⁸	a	Proportional or scintillation counter

4.4 Labelling

An identification number shall be marked for each sample container and the following information shall be provided with the sample:

- a) Name and address of person requesting examination;
- b) Exact place from which sample was taken; and
- c) Date, time and weather conditions when sample was taken and despatched.

5 METHODS OF TEST

5.1 Samples obtained as described in 4 shall be tested for relevant requirements of the standard as prescribed in SLS 614, Appendix A and the following publications:

- a) American Public Health Association (APHA), American Water Works Association (AWWA) and Water Pollution Control Federation (WPCF) Standard Methods for the Examination of Water and Waste Water; 15th ed. or latest ed. New York, APEA.
- b) Global Environmental Monitoring Systems Water Operational Guide UNESCO/WHO, 1978.

5.2 For certain determinants two test methods have been given in Table 1. The reference method shall be used in case of dispute.

APPENDIX A

DETERMINATION OF FREE CARBON DIOXIDE

A.1 REAGENTS

A.1.1 *Phenolphthalein indicator solution*, dissolve 0.1 g of phenolphthalein in 60 ml of rectified spirit and dilute with distilled water to 100 ml.

A.1.2 *Sodium carbonate solution*, standard volumetric solution, $c(\text{Na}_2\text{CO}_3) = 0.01 \text{ mol/l}$.

A.1.3 *Buffer solution*

Dissolve 1.237 g of boric acid in carbon dioxide-free distilled water and make up to 100 ml - (a).

Dissolve 1.491 g of potassium chloride in carbon dioxide-free distilled water and make up to 100 ml - (b).

Mix 25 ml of (a) with 25 ml of (b). Add 2.95 ml of 8 g/l sodium hydroxide solution to the mixture and dilute with carbon dioxide-free distilled water to 100 ml. When required for use, dilute 10 ml of the solution to 100 ml with carbon dioxide-free distilled water.

A.2 PROCEDURE

Pipette out 200 ml of the sample into a 250-ml glass-stoppered bottle. Add 1 ml phenolphthalein indicator solution and titrate with standard sodium carbonate solution (A.1.2), with gentle agitation. Compare the tint with that obtained with 100 ml of buffer solution (A.1.3) to which 1 ml of indicator solution has been added. At the end point, the tint of the sample and the control shall be identical after one minute. The stopper shall be replaced after each addition of sodium carbonate solution.

A.3 CALCULATION

Free carbon dioxide (as CO_2), in mg/l, $= 2.2 V$

where,

V = volume, in ml, of standard sodium carbonate solution used in the titration

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Further particulars of the terms and conditions of the permit may be obtained from the Sri Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.



SRI LANKA STANDARDS INSTITUTION

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The principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote standardization and quality control by educational, consultancy and research activity.

The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and administrative control is vested in a Council appointed in accordance with the provisions of the Act.

The development and formulation of National Standards is carried out by Technical Experts and representatives of other interest groups, assisted by the permanent officers of the Institution. These Technical Committees are appointed under the purview of the Sectoral Committees which in turn are appointed by the Council. The Sectoral Committees give the final Technical approval for the Draft National Standards prior to the approval by the Council of the SLSI.

All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution endeavours to ensure adequate representation of all view points.

In the International field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of standardization as are of special interest to Sri Lanka.

