

**SRI LANKA STANDARD 775 : 1987**

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**TOLERANCE LIMITS FOR  
MARINE COASTAL WATERS  
LIABLE TO POLLUTION**

**SRI LANKA STANDARDS INSTITUTION**



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POLLUTION

SLS 775:1987

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SRI LANKA STANDARDS INSTITUTION

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Sri Lanka.



SRI LANKA STANDARD

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**FOREWORD**

This Sri Lanka Standard has been authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 1987-01-07, after the draft, finalized by the Drafting Committee on Industrial Effluents, had been approved by the Chemicals Divisional Committee.

Marine environment is intended to cover, in addition to the sea and oceans, creeks and tidal waters. Within the estuarine region, the marine environment will extend up to low tide level; water above that point will fall in the region of inland surface waters. Marine coastal areas shall extend up to 5 km from the mean high water line. Pollution of marine coastal areas with sewage, effluents and wastes from the hinterland and from ships is an important problem associated with industrial development, growth of coastal towns and navigational activities in ports and harbours. This standard is being published in order to prevent such pollution, and to preserve the quality of marine coastal waters for such purposes as bathing and recreation, propagation of fish and other marine life, salt manufacture, boating and navigation and commercial fishing.

The considerations for deciding on regulations for disposing of wastes into the marine coastal areas and for determining the urgency for terminating disposal operations should include the following:

- a) Present and future impact on the marine environment, human health, welfare and amenities;
- b) Irreversibility of the impact of uncontrolled discharges;
- c) Volume and concentration of pollution involved; and
- d) Location of disposal point, that is, length of pipeline, and its depth, and potential impact of the location relative to the uses of the receiving water.

High priority should be given to protecting the biologically most active portions of the sea bed and near-shore areas in which many marine organisms breed and spawn.

This standard is intended essentially to help the local authorities in laying down restrictions on the discharge of sewage and industrial effluents from adjacent areas, and of wastes from ships. Some of the discharges should be totally prohibited, as mentioned in the standard, and other discharges should be so regulated that the composition of the coastal waters do not exceed the tolerance limits prescribed in this standard for the specified use of the waters. The standard is, therefore, expected to assist the local authorities in deciding on the siting of industrial plants, the degree of concentration of industry at a given place and the mode of discharge of effluents. The local authorities whenever necessary shall consult the Central Environmental Authority.

The authorities should bear in mind that concentration of industries can give rise to a situation where, although each industrial effluent complies with the relevant standard, the combined effect of the effluents may render the coastal waters unsuitable for the intended use.

This standard should not be taken as laying down the specification for water suitable for the uses mentioned in Table 1 because such criteria depend on a number of factors. The suitability of an individual water for a certain area or purpose would also depend on the local conditions.

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 an analysis, shall be rounded off in accordance with CS 102. The number of significant places retained in this 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, the American Public Health Association and the Indian Standards Institution is gratefully acknowledged.

## 1 SCOPE

1.1 This standard prescribes tolerance limits and methods of sampling and test for marine coastal waters liable to pollution.

1.2 This standard does not apply to waste disposal on the high sea.

## 2 REFERENCES

- IS 6582 Bio-assay methods for evaluating acute toxicity for industrial effluents and waste waters
- 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
  - Part 2 Bacteriological requirements

## 3 PROHIBITIONS

Discharges given below shall be prohibited in marine coastal areas except under specified safeguards prescribed by the local authority:

- a) Uncontrolled discharge of sewage and industrial effluents;
- b) Solid wastes of domestic or industrial origin;
- c) Radioactive effluents and solid wastes;
- d) Sand, gravel washings and water containing heavy clay suspensions or ash;
- e) Unscreened organic suspended solids larger than 3 mm in diameter; and
- f) Solid wastes, oils and sewage from ships.

## 4 REQUIREMENTS

4.1 Effluent discharge shall not be permitted if the composition of water in the marine coastal areas exceeds tolerance limits for different uses prescribed in Table 1.

TABLE 1 - Tolerance limits for water quality

Determinant	Tolerance limit		Method of test (Ref. to publications in Clause 6 and SLS 614)	Technique of the method
	For bathing, recreation, fish culture and salt manufacture	For harbour water		
1) Colour	No noticeable colour	No noticeable colour	a	Colorimetry-tristimulus filter method (Ref. method) Colorimetry-spectrophotometric method
2) Odour	No offensive odour	No offensive odour		Sensory evaluation
3) Floating material	No visible floating matter of sewage or industrial waste origin	No visible floating matter		Visual method
4) Suspended solids	No visible suspended solids of sewage or industrial waste origin	Not specified		Visual method
5) pH range at ambient temperature	6.5 to 8.5	6.5 to 9.0	a	Electrometry by means of a pH meter with a glass electrode (Ref. Method) Colorimetry, Winkler (azide modification) method
6) Biochemical oxygen demand (BOD), mg/l, max.	5	5	b	Incubation for 5 days at 20 °C (Ref. method) Incubation for 3 days at ambient temperature
7) Oils and Greases (sampled in 300 mm surface layer), mg/l, max.	0.1	10	a	Gravimetry, liquid-liquid extraction, with trichlorotrifluoro ethane

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Determinant	Tolerance limit		Method of test (Ref. to publications in Clause 6 and SLS 614)	Technique of the method
	For bathing, recreation, fish culture and salt manufacture	For harbour water		
8) Phenolic compounds (as phenolic OH), mg/l, max.	0.1	Not specified	a	Colorimetry-chloroform extraction method
9) Arsenic (as As), mg/l max.	0.2	Not specified	a	A.A. Spectrophotometric method
10) Mercury (as Hg), mg/l max.	0.0003	Not specified	a	A.A. Spectrophotometric method
11) Free Ammonia (as N), mg/l, max.	1.2	Not specified	Appendix B of SLS 614: Part 1 a, b	Colorimetry-Nesslerization (Ref. Method) Colorimetry-phenate method
12) Dissolved oxygen (DO) mg/l, min.	3	3	b	Azide modification method
13) Pesticides (chlorinated hydrocarbons as Cl), mg/l max.	0.002	Not specified	a	Gas chromatography
14) Coliform bacteria, most probable number (MPN) per 100 ml max.	1000	2500	SLS 614: Part 2	
15) Bio-assay test	Not less than 90 per cent of test animals shall survive in 96-hour test.	Not specified	IS 6582	

## 4.2 Radioactive emitters

While no limits are being prescribed for the gross content of alpha and beta emitters in the marine coastal waters, it should be kept in mind that the concentration of some radioisotopes shall not be allowed to exceed maximum permissible levels. These values are given in Table 2.

TABLE 2 - Values for radioactive emitters

Sl. No. (1)	Radioisotope (2)	Maximum permissible concentration, $\mu\text{c/ml}^*$ (3)
i	Phosphorous 32	$2 \times 10^{-9}$
ii	Sulfur 35	$3 \times 10^{-5}$
iii	Chromium 51	$4 \times 10^{-5}$
iv	Iron 59	$5 \times 10^{-8}$
v	Nickel 63	$2 \times 10^{-5}$
vi	Zinc 65	$4 \times 10^{-8}$
vii	Strontium 89	$3 \times 10^{-5}$
viii	Strontium 90	$3 \times 10^{-7}$
ix	Zirconium 95	$1 \times 10^{-5}$
x	Ruthenium 106	$2 \times 10^{-7}$
xi	Silver 110	$5 \times 10^{-8}$
xii	Iodine 131	$4 \times 10^{-6}$
xiii	Caesium 134	$9 \times 10^{-7}$
xiv	Caesium 137	$2 \times 10^{-6}$
xv	Barium 140	$3 \times 10^{-5}$
xvi	Cerium 144	$1 \times 10^{-5}$
xvii	Radium 226	$3 \times 10^{-9}$
xviii	Radium 228	$8 \times 10^{-9}$
xix	Natural uranium	$2 \times 10^{-5}$

\*  $\mu\text{c/ml}$  - microcuries per millilitre

## 5 SAMPLING

### 5.1 General requirements of sampling

5.1.1 When samples are taken for testing of chemical requirements, the following precautions and directions shall be observed:

5.1.1.1 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.

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

5.1.1.3 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.

5.1.1.4 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.

*NOTE - Containers, methods of preservation of samples and recommended maximum storage time are given in Appendix A of SLS 614:Part 1:1983.*

5.1.2 When samples are taken for bacteriological examination the following precautions and directions shall be observed:

5.1.2.1 The samples for bacteriological examination shall be taken first.

5.1.2.2 Samples shall be collected in sterilized glass bottles. They shall be fitted with ground glass stoppers or metal screw caps. Stopper and neck of the bottle shall be protected from contamination by a suitable cover, either of aluminium foil or other suitable material.

5.1.2.3 Interval between collection of samples and beginning of examination shall not exceed 24 hours. If the time interval between collection and examination is to exceed one hour the samples shall be transported to the laboratory in iced coolers ( $4 \pm 2$  °C). Samples shall not be frozen.

### 5.2 Drawing of samples

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

5.2.2 Separate samples shall be taken for testing of bacteriological requirements and chemical requirements.

### 5.3 Size of the sample

5.3.1 The sample size for chemical analysis shall be at least 5 litres.

5.3.2 The sample size for bacteriological examination shall be at least 200 ml.

### 5.4 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.

### 5.5 Number of tests

5.5.1 Samples obtained as in 5.1.1, 5.2 and 5.3.1 shall be tested for chemical requirements of this standard.

5.5.2 Samples obtained as in 5.1.2, 5.2 and 5.3.2 shall be tested for microbiological requirements of this standard.

## 6 METHODS OF TEST

6.1 Samples obtained as described in 5 shall be tested for the relevant requirements of the standard as prescribed in SLS 614 and the following publications.

a) American Public Health Association, American Water Works Association and Water Pollution Control Federation, Standard Methods for the examination of Water and Waste Water; 15th ed, or latest ed. New York, APEA.

b) Global Environmental Monitoring Systems Operational Guide, UNESCO/WHO 1978.

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

## 7 CONFORMITY TO STANDARD

The samples of water obtained for testing shall be considered as conforming to the requirements of this standard, if the samples tested as in 5.5 satisfy the relevant requirements.

## **SLS CERTIFICATION MARK**

*The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI which includes surveillance inspection of the factory, testing of both factory and market samples.*

*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**

The Sri Lanka Standards Institution (SLSI) is the National Standards Organization of Sri Lanka established under the Sri Lanka Standards Institution Act No. 6 of 1984 which repealed and replaced the Bureau of Ceylon Standards Act No. 38 of 1964. The Institution functions under the Ministry of Science & Technology.

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.