SRI LANKA STANDARD 1194 : 1999

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TOLERANCE LIMITS FOR EFFLUENTS FROM THE PALM OIL INDUSTRY

SRI LANKA STANDARDS INSTITUTION

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SLS 1194 : 1999

Gr. 3

SRI LANKA STANDARDS INSTITUTION
No. 17, Victoria Place
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SRI LANKA

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FOREWORD

This Sri Lanka Standard was approved by the Sectoral Committee on Chemicals and Polymer Technology and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 1999-11-11 .

The tolerance limits prescribed in this standard are intended to guide the local authorities in framing rules regarding disposal of effluents from the Palm oil industry. In arriving at a decision on the tolerance limits and site selection the authorities shall, in consultation with the regulatory body in charge of Environmental Protection, give due consideration to the local conditions. This standard is expected to play a vital role in environmental protection.

Tolerance limits for colour and odour have not been prescribed in this standard but it is recommended that as far as practicable, colour and unpleasant odours shall not be present in the effluents.

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 the rounded off value shall be the same as that of the specified value in this standard.

In the preparation of this standard the assistance obtained from the following publications is gratefully acknowledged:

APHA-AWWA-WPCF , Standard methods for the examination of water and waste water: 18th edition, 1992.

GEMS/WATER Operational guide, UNEP/WHO/UNESCO/WMO Project on Global water quality monitoring

1 SCOPE

This standard prescribes tolerance limits and methods of sampling and tests for effluents from industries involved in palm oil extraction after treatment at the point of discharge into inland surface waters and marine coastal waters and on land for irrigation purposes.

2 REFERENCES

APHA -AWWA - WPCF Standard methods for the examination of water and waste water.

CS 102 Presentation of numerical values
SLS 652 Tolerance limits for industrial effluents discharged into inland surface waters
SLS 776 Tolerance limits for industrial effluents discharged on land for irrigation purposes

3 REQUIREMENTS

3.1 Effluents from the palm oil industry shall comply with the tolerance limits specified in Table **1**.

3.2 When industrial effluents are applied on agricultural land, the hydraulic loading rates given in table **2** of **SLS 776 : 1987** shall be followed.

4 METHODS OF TEST

4.1 Tests shall be carried out in accordance with the methods given in American Public Health Association (APHA), American Water Works Association (AWWA) and Water Protection Control Federation (WPCF); Standard Methods for the examination of water and waste water : 18 th edition, New York, APHA -AWWA-WPCF : 1992

4.2 For certain determinants two test methods have been given in the table. The reference method shall be used in case of dispute.

5 SAMPLING

Representative samples of the effluent shall be obtained as prescribed in Appendix **A** .

6 CONFORMITY TO STANDARD

The sample of effluents obtained for testing shall be considered as conforming to the requirements of this standard, if the composite sample tested as in **A.7.2.1** satisfy the relevant requirements.

TABLE 1 - Tolerance limits for effluents from palm oil industry

Sl. No	Determinant	Tolerance limit			Method of test	Technique of the method
		Effluents discharged into inland surface waters	Effluents discharged into marine coastal waters	Effluents discharged on land for irrigation purposes		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(i)	Temperature (at the point of discharge), ^{0}C max.	40	45	35	4.1	Electrometric or Mercury thermometer
(ii)	pH value at ambient temperature	6.0 to 8.5	6.0 to 8.5	5.5 to 9.0	4.1	Electrometry by means of pH meter with a glass electrode
(iii)	Biochemical oxygen demand (BOD), at 30 ^{0}C for 3 days, mg/l, max.	60	100	250	4.1	Electrode or Manometer method (Routine method) Winkler Titrimetric method or Azide modification (Reference method)
(iv)	Chemical oxygen demand(COD), mg/l, max.	400	400	650	4.1	Dichromate reflux
(v)	Total dissolved solids mg/l, max.	-	-	2100	4.1	Glass fibre filtration,filtrate drying at 180 ^{0}C
(vi)	Total suspended solids, mg/l, max.	50	150	400	4.1	Glass fibre filtration residue drying at 103 ^{0}C to 105 ^{0}C
(vii)	Oils and greases, mg/l, max.	10	20	10	4.1	Gravimetry, liquid- liquid extraction with n-hexane and methyl, tert-butyl-ether (80 : 20 ratio)
(viii)	Ammoniacal nitrogen, mg/l,max.	50	50	-	4.1	Nesselerization method, Titrimetry or Ammonia selective electrode method
(ix)	Total nitrogen, mg/l,max	200	-	-	4.1	Kijeldahl method

APPENDIX A

SAMPLING

A.1 GENERAL REQUIREMENTS OF SAMPLING

A.1.1 Sample containers

The sample shall be collected in clean glass Winchester Quartz bottles with glass stoppers or plastic containers with plastic lids. The containers for various determinants shall be selected as in Appendix A of **SLS 652 : 1984**.

A.1.2 Sampling instruments

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

A.2 COLLECTION OF SAMPLES

A.2.1 The bottles shall be well rinsed with the effluents to be sampled before being filled. Having filled the bottle the stopper shall be rinsed with the effluents and inserted firmly. The bottle containing the sample shall be filled so that a small air bubble is present after closure to prevent leakage or even breakage arising from any subsequent changes in temperature.

As far as possible the bottle shall be filled direct from the source. Care shall be taken to prevent any external contamination during the process of sampling. Care shall be taken to take the samples in such a way as to maintain true proportion of suspended solids.

A.2.2 The minimum sample size shall be selected as in Appendix A of **SLS 652 : 1984**.

A.3 PRESERVATION OF SAMPLES

A.3.1 The sample shall be kept at a low temperature (4 ± 1 ^{0}C) immediately after collection and thereafter. Storage at 3 ^{0}C to 4 ^{0}C in insulated ice box or refrigerator is the best way to preserve samples till the next day.

A.3.2 No single method of preservation is applicable for all the tests.

A.3.3 The method of preservation of samples for various determinants shall be selected as in Appendix A of **SLS 652 : 1984** .

A.4 TIME OF TEST

A.4.1 The measurement of particle size of suspended solids, the temperature and pH shall be carried out at once at the place of sampling.

A.4.2 If the tests are not to be carried out at once at the place of sampling, the sample shall be transported to the laboratory without delay. The samples shall be kept cool on transit.

A.4.3 The tests shall be carried out as soon as possible, in any case within 48 hours of sampling, unless otherwise specified in Appendix **A** of **SLS 652 : 1984**.

A.5 LABELLING

The label on the bottle shall bear the name of the sampling authority, details of the type of sample, place , date and time of sampling and preferably pH, temperature and odour of sample.

A.6 POINT OF SAMPLING

If the composition of an effluent finally discharged by a factory is to be ascertained the point of sampling shall be the final outlet of the effluent treatment plant. If there is no treatment plant it shall be the effluent outlet immediately outside the factory premises.

A.7 FREQUENCY OF SAMPLING

A.7.1 When it is required to find out the variation in the composition of an industrial effluent during a specified period, individual samples shall be taken at short and appropriate intervals (every 5, 10, 15 or 30 minutes) and analysed.

A.7.2 When it is required to study average condition over a cycle of operation or a period or during the daily working period of the industry individual samples shall be collected at appropriate time intervals from the common channel or drain at a point where the flow of the effluent is likely to be most representative of the entire volume of effluents. The volume of the individual samples taken at a time shall depend on the volume of the effluents flowing at that time. The sampling interval shall depend upon the frequency of variation in the nature of the effluents and the volume of flow. (In most cases, collection of samples at hourly intervals would be sufficient).

A.7.2.1 The individual samples shall be mixed together to form a composite sample and analysed for the requirements given in Clause **3** .

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