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| **ECOWAS** |  | **DHS ECOSTAND XX: 2022** |
| **STANDARD** |  |  |

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|  | | **Textile Industry - Requirements for wastewater (effluent) discharge** | |
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|  |  | | **Reference Number**  **CD ECOSTAND XX: 2022(E)**  **© ECOSTAND 2022** |
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**Foreword**

The Economic Community of West African States (ECOWAS) was established on 28th May 1975 by Heads of States and Governments of fifteen (15) Member States as an Economic Community of the Region. The Treaty was reaffirmed in 1993.

One of the important mandates of ECOWAS is to promote the establishment of Common Market, the development and harmonization of Standards and conformity assessment procedures and Measures in order to reduce Technical Barriers to Trade, encourage intra and international Trade as well as enhance the industrialization of the region.

ECOWAS Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The work of preparing ECOWAS Standards is normally carried out through ECOWAS Technical Committees. Each member body interested in a subject for which a Technical Committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ECOWAS, also take part in the work.

The main task of the Technical Committees is to prepare ECOWAS Standards. Draft ECOWAS harmonized Standards adopted by the technical Committees are circulated to the member states for voting. Publication as an ECOWAS Standard requires approval by at least 75% of the member states casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ECOWAS shall not be held responsible for identifying any or all such patent rights.

The work of preparing this standard was carried out by the ECOWAS Technical Harmonization Committee 3 (THC3) *Chemistry.*

**ECOWAS REGIONAL STANDARD DHS ECOSTAND XX: 2022(E)**

**Wastewater from industrial and artisanal dyeing**

1. **Scope**

This standard specifies the requirements and test methods for wastewater (effluent) discharged by the textile industry.

1. **Normative references**

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

*-* ISO 7887*, Examination and determination of color*

- ISO 10523*, Water quality - Determination of pH*

- ISO 7027*, Water Quality - Determination of Turbidity - Part 1: Quantitative Methods*

- ASTM D5907*, Standard Test Methods for Filterable (Total Dissolved Solids) and Non-Filterable (Total Suspended Solids) in Water*

- ISO 6060*, Water quality - Determination of chemical oxygen demand*

- ISO 15705*, Water Quality - Determination of Chemical Oxygen Demand Index (COD-CD) - Small scale closed tube method*

*-* APHA 5210 *method B or D*

*-* ISO 8288*: Water quality - Determination of cobalt, nickel, copper, zinc, cadmium and lead - Atomic absorption spectrometric methods with flame*

- ISO 10304-1*, Water quality - Determination of dissolved anions by liquid chromatography - Part 1: Determination of bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulfate*

- US EPA 1664*, Method 1664, Revision B: n-Hexane Extractables (HEM; oil and grease) and treated silica gel n-Hexane Extractables (SGT-HEM; non-polar material) by Extraction and gravimetry*

*- APHA method 4500-P, Standard methods for the. Examination of Water and Wastewater*

*-* ISO 11885*, Water quality - Determination of selected elements by inductively coupled plasma optical emission spectroscopy (ICP-OES)*

*-* ISO 9174:, *Water quality - Determination of chromium*

*-* ISO 6439*, Water quality - Determination of phenol number - 4-Amino antipyrine spectrometric method after distillation*

*-* USEPA 420.1*, Phenolics (Spectrophotometric, Manual 4 AAP with distillation)*

*-* APHA 5530 B / C / D, *Phenols-standard methods*

*-* ASTM D5257-1*:*

*-* USEPA 7199*, Determination of hexavalent chromium in drinking water, groundwater and industrial wastewater effluents by ion chromatography*

*-* ASTM D2036*, Standard Test Methods for Cyanides in Water*

*-* US EPA 335.2*, Determination of cyanide in drinking water, surface water and saline water, waste*

- ISO 17378 - 2 *: Water quality - Determination of arsenic and antimony - Part 2: Hydride generation atomic absorption spectrometry (HG-AAS) method*

*-* USEPA 206.2, *Methods for Chemical Analysis of Water and Waste*

**3. Terms and definitions**

For the purpose of this standard, the following definitions and terms shall apply:

**3.1**

**wastewater**

liquid waste or sewage discharged into the environment.

**3.2**

**receiving environment**

all places where wastewater is discharged.

**3.3**

**discharge**

The introduction of wastewater into the receiving environment.

**3.4**

**sewer network**

a branched system of underground pipes connecting the multiple production points (private connection, storm water outlet, etc.) to the point of discharge and/or treatment.

**3.5**

**Wastewater sludge**

the residual solids from a primary or secondary wastewater treatment process.

**3.6**

**Pollution**

the direct or indirect discharge of substances or energy by humans into the natural environment with consequences that endanger human health, harm the environment or interfere with other legitimate uses of natural resources.

**4. Requirements**

**4.1 General**

**4.1.1** Every facility shall install pollution control system for the detoxification or treatment of effluent discharges emanating from their operations and such system shall be based on best available technology. In the absence of pollution control equipment, a facility shall implement measures to control pollution.

**4.1.2** Every facility shall ensure that any effluent discharged are within requirements specified in Table 1

**4.2 Specific requirements**

For the discharge of wastewater from industrial and artisanal dyeing, two cases are to be considered:

- direct discharge into a receiving environment

- sending to a treatment plant before discharge into a receiving environment.

The threshold values of the effluent parameters for both cases are given in the table below:

**Table 1 – Chemical requirements**

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| --- | --- | --- | --- |
|  | Parameter | With treatment station | Test Method |
| 1 | Colour | 400 TCU | ISO 7887 |
| 2 | pH | 5,5 ― 8,5 | ISO 10523 |
| 3 | Temperature | < 30 °C |  |
| 4 | Turbidity | 75 NTU | ISO 7027 |
| 5 | Total Suspended solids (TSS) | 600 mg/l | ASTM D5907 |
| 6 | Chemical Oxygyen Demand (COD) | 2 000 mg/l | ISO 6060  ISO 15705 |
| 7 | Biochemical Oxygen Demand (BOD5) | 800 mg/l | APHA 5210 method B or D |
| 8 | Total nitrogen, N | < 150 g/l | ISO 10304-1 |
| 9 | Oil and grease | 5 mg/l | US EPA 1664 |
| 10 | Total phosphorus, P | < 50 mg/l | APHA method 4500-P |
| 11 | Lead | < 0,5 mg/l | ISO 8288  ISO 11885 |
| 12 | Total Chromium | < 0,5 mg/l | ISO 9174 |
| 13 | Copper | < 0,5 mg/l | ISO 8288  ISO 11885 |
| 14 | Zinc | < 2 mg/l | ISO 8288  ISO 11885 |
| 15 | Phenolic index | 0,3 mg/l | ISO 6439  USEPA 420.1  APHA 5530 B / C / D |
| 16 | Hexavalent chromium | 0,1 mg/l | ASTM D5257-1  USEPA 7199 |
| 17 | Total cyanide | 0,1 mg/l | ASTM D2036  US EPA 335.2 |
| 18 | AOX Halogenated Organic Compounds | 5 mg/l |  |
| 19 | Arsenic | 0,1 mg/l | ISO 17378 – 2  USEPA 206.2 |
| 20 | Total hydrocarbons | 10 mg/l |  |
| 21 | Total metals | 15 mg/l |  |
| 22 | Fluoride | No value given |  |

Note: Total metals are the sum of the mass concentration per litre of the following elements: Pb, Cu, Cr, NI, Zn, Sn, Cd, Hg, Fe, Al.

1. **Methods of analysis and sampling**

Reference values are determined in accordance with the referenced methods.

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