MALAWI STANDARD

# Industrial effluents – Tolerance limits for discharge into inland surface waters

## 1 SCOPE

**1.1** This standard lays down the tolerance limits for industrial effluents discharged into inland surface waters, sampling guidelines and test methods.

**1.2** Effluents discharged on land or into ground water or air are not covered by this standard.

## 2 TOLERANCE LIMITS

Tolerance limits for industrial effluents are given in table 1.

**Table 1 – Tolerance limits for industrial effluents**

| Characteristic | Tolerance limits |
|---|---|
| Total suspended solids, mg/ℓ, max | 30 |
| Particle size of total suspended solids, mg/ℓ | Shall pass 850 micron |
| Total dissolved solids, mg/ℓ, max | 500 |
| Total residual chloride mg/ℓ, max | 1 |
| *pH* | 6,5 to 9,0 |
| Temperature (in any section of the stream within 15 metres down stream from the effluent outlet), °C, max. | 40 °C |
| Biochemical oxygen demand for 5 days at 20 °C, mg/ℓ,max | 60 |
| Chemical oxygen demand after 1 hour's quiescent settlement, mg/ℓ, max | 20 |
| Oils and grease and other liquids immiscible with water, mg/ℓ, max | 2,5 |
| Edible oils, mg/ℓ, max | 10 |
| Colour, TCU, max | 25,0 |
| Turbidity, NTU, max | 25,0 |
| Effluent volume/day $m^3$, max | 5,0 |
| Dilution ratio, effluent : receiving water body, max | 8,0 |
| Radioactive materials: | |
| Alpha emitters, u c/mℓ, max | $10^{-7}$ |
| Beta emitters, u c/mℓ, max | $10^{-6}$ |
| Insecticides | Nil |
| Pesticides: | |
| Organochlorides, mg/ℓ, max | 0,10 |
| Organophosphates, mg/ℓ, max | 0,20 |

Table 1 *(concluded)*

| Characteristic | Tolerance limit |
|---|---|
| Carbonates, mg/ℓ, max | 0,15 |
| Nitrogen derivatives, mg/ℓ, max | 0,05 |
| Ammoniacal nitrogen, mg/ℓ, max | 10 |
| Sulphates (as $SO_4^{2-}$), mg/ℓ, max | 800 |
| Nitrates, mg/ℓ, max | 50 |
| Nitrites, mg/ℓ, max | 1,0 |
| Phenolic compounds and cresols, mg/ℓ, max | 1 |
| Cyanides (as CN) and all compounds from which hydrocyanic acid is liberated on acidification, mg/ℓ, max | 0,05 |
| Sulphides (as S) and all compounds from which hydrogen sulphide is liberated on acidification, mg/ℓ, max | 2,0 |
| Fluorides (as F), mg/ℓ, max | 2,0 |
| Arsenic (as As), mg/ℓ, max | 0,05 |
| Cadmium (as Cd), mg/ℓ, max | 0,01 |
| Hexavalent chromium (as Cr), mg/ℓ, max | 0,05 |
| Total Chromium, mg/ℓ, max | 0,05 |
| Bromides,mg/ℓ, max | 8,0 |
| Copper (as Cu), mg/ℓ, max | 2,0 |
| Lead (as Pb), mg/ℓ, max | 0,05 |
| Mercury (as Hg), mg/ℓ, max | Nil |
| Nickel (as Ni), mg/ℓ, max | 0,01 |
| Selenium as (se), mg/ℓ, max | Nil |
| Zinc (as Zn), mg/ℓ, max | 5 |
| Phosphates, mg/ℓ, max | 0,15 |
| Inorganic compounds | 0,01 |

## 3 SAMPLING – GENERAL GUIDELINES

**3.1** Samples shall be taken in clean colourless glass bottles provided with ground-in glass stoppers.

**3.2** Certain determinations (e.g. dissolved oxygen, oil, sulphide) must be performed on a separate sample taken specifically for the purpose in another bottle.

**3.3** When sampling rinse the bottle once or twice or thrice with the sample.

**3.4** A representative sample containing the true proportion of suspended matter to liquid shall be obtained. Any deposit on the bottom of the water body, sewage fungus growing on the bed, etc. should not be included.

Such extraneous matter should be separately collected and examined.

**3.5** The taking of sample in a bottle of absolutely clear and colourless glass facilitates a general description for the appearance of the sample. The description for the settled sample should include the smell, the colour and the degree of turbidity of the supernatant liquid.

It should also include apparent quantity and general characteristics of the sediment (e.g. whether finely divided, flocculent, sandy, etc).

## AIR QUALITY STANDARD

Currently, the standard for emissions is being worked on but will be based on the South African Standard for new installation:

Particulate Matter : 50 mg/m3 max

$SO_2$ : 500 mg/m3 max

$NO_x$ : 750 mg/m3 max