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Acoustics — Noise pollution — Tolerance limits

RWANDA BUREAU OF STANDARDS

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In order to match with technological development and to keep continuous progress in industries, Standards are subject to periodic review. Users shall ascertain that they are in possession of the latest edition

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Foreword

Rwanda Standards are prepared by Technical Committees and approved by Rwanda Bureau of Standards (RBS) Board of Directors in accordance with the procedures of RBS and in compliance with the Annex 3 of the WTO/TBT agreement on the preparation, adoption and application of standards.

The main task of technical committees is to prepare national standards. Final Draft Rwanda Standards adopted by Technical committees are ratified by members of RBS Board of Directors for publication and gazetting as Rwanda Standard.

RS 236 was prepared by the Technical Committee RBS/TC 13 *Environment health and safety*.

In the preparation of this standard, reference was made to the following standards

1) MS 175, *Burnt clay bricks – Code of practice for moulding and firing*

2) RS 177: 2014, *Mining and quarrying — Code of practice*.

The assistance delivered from the above source is hereby acknowledged with thanks.

Committee membership

The following organizations were represented on the Technical Committee on Environment health and safety (RBS/TC 13) during the development of this standard.

Appropriate Community Sanitation & Energy Services International (ACSES-I)

Biofuel Rwanda

Cimenterie du Rwanda (CIMERWA)

Compagnie pour l'environement et le Dévoloppement (COPED)

Energy Water and Sanitation Authority (EWSA)

KANOMBE Military Hospital

KINAZI Cassava Plant

KING FAYCAL Hospital

Peat Energy Company

Resources Efficient and Cleaner Production Centre (RECP)

Rwanda Environment Management Company (RWEMACO)

Rwanda Environmental Management Authority (REMA)

Rwanda Utilities Regulatory Authority (RURA)

SULFO Industries

UMUTARA Polytechnic

University of Rwanda – College of Arts and Social Sciences (UR-CASS)

University of Rwanda – College of Science and Technology (UR-CST)

Rwanda Bureau of Standards (RBS) — Secretariat

Acoustics — Noise pollution — Tolerance limits

1 Scope

This Rwanda Standard prescribes maximum allowable noise limits in industrial, commercial, residential and silence zone areas in respect to human beings. It also lay down sound level requirements for indoors of non-industrial buildings.

2 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.

RS 183, *Occupation health and safety — Management system — Requirements.*

3 Terms and definitions

For the purposes of this standard, the following definitions apply:

3.1

decibel (dB) one tenth of a bel

bel is the fundamental division of a logarithmic scale used to express the ratio of two specified or implied quantities, the number of bels denoting such a ratio being the logarithm to the base of 10 of this ration

3.2

day time

6 a.m to 9 p.m

3.3

night time

9 p.m to 6 a.m

3.4

Silence zone

areas up to 100 m around such premises as hospitals, educational, institutions, libraries and courts

3.5

threshold of audibility

zero decidel(dB).

4 Criteria for noise

4.1 In selecting criteria to evaluate a situation, it is important to recognize various problems that may be caused by the noise. Criterion for environmental noise is the best development basing on problems faced by human beings, physical damage to structure and reduces utility of property.

4.2 Noise has effects on health as specified in 4.2.1 - 4.2.4.

4.2.1 Physical injury; exposure to sound pressure levels exceeding 140 dB, even for short period involves a risk of morphological damage to the ear;

4.2.2 Hearing loss; long term occupational exposure to high level noise greater than 70 dB can result in a gradual loss of hearing;

4.2.3 Non-specific health effects; noise also results into physiological reactions such as; changes in heart rate, blood pressure and peripheral reactions and vestibular reactions. Many of these noise-induced reactions are non-specific and are usually referred to as stress reactions; and

4.2.4 Interference effects; these include; sleep interference, communication interference, and task performance.

5 Tolerance limits for noise

5.1 The categorization and tolerance limits for noise as specified in table 1 and table 2 is recommended.

Table 1 — Ambient air quality standards in respect of noise

Area Code	Category of area	Limit in dB, Max.	
		Day time	Night time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential area	55	45
D	Silence Zone	50	40

Table 2 — Maximum acceptable noise levels inside buildings

S/No	Type of building	Maximum acceptable noise levels (dB)
1	Offices	50 - 60
2	Dwellings(Houses and Flats)	45 - 55
3	Schools(Classrooms or lecture rooms)	45 - 50
4	Hospitals	40 - 50

5.2 The silence zones should be declared by a competent authority. Use of vehicle horns, hand speakers are bursting or cracking shall be banned in these zones.

5.3 The maximum recommended noise dose and exposure levels as specified in Table 3 should be observed.

Table 3 — Maximum recommended noise dose — Exposure levels

Noise level (dBA)	Maximum exposure time per 24 h
85	8 h
88	4 h
91	2 h
94	1 h
97	30 min
100	15 min
103	7.5 min
106	3.7 min
109	112 sec
112	56 sec
115	28 sec
118	14 sec
121	7 sec
124	3 sec
127	1 sec
130 – 140	less than 1 sec
140	NO EXPOSURE

6 Occupational health and safety for noise

6.1 No person shall be exposed to sound levels exceeding:

a) 70 dB of continuous level in any one way;

b) 85 dB of reasonably constant level for 8 h continuously in any one day;

c) 135 dB as measured with an instrument set as ‘fast’ in any one day; and

d) 150 dB in case of impulse as measured with an instrument set at ‘fast’ in any day.

6.2 If exposure is for periods other than eight hours, or if the sound level is fluctuating, an equivalent sound level shall be calculated, and this resultant noise shall not exceed the equivalent 85 dB.

6.2 All areas where people may be exposed to sound levels exceeding the limits specified in Table 3 shall be identified as ear protection areas and shall be suitably condoned off.

7 Noise and town planning

7.1 Residential areas shall be set off from various roads according to average noise level that may emanate from them at any time. It is difficult to reduce outdoor noises coming into building. Therefore, it is advisable that during town layout planning (even planning of a suburb) the location of residential buildings, in particular, be so arranged that they are far away from traffic, industrial, noisy surroundings.

7.2 Residential buildings situated on roads carrying heavy traffic should need similarly to be set off from the road adequately and suitably oriented so as to attenuate the noise to a required degree.

8 Industrial noise

Attention should be given to them during zoning to protect people from unnecessary noise.

ICS 13.140