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Foreword

Rwanda Standards are prepared by Technical Committees and approved by Rwanda Standards Board (RSB) Board of Directors in accordance with the procedures of RSB, in compliance with 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 RSB Board of Directors for publication and gazettment as Rwanda Standards.

DRS nnn-2 was prepared by Technical Committee RSB/TC 033, *Tourism and hospitality.*

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

KS 2814: 2018: Conservation cultural property — Guidelines for design of showcases for exhibition and preservation of objects — General requirements

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

Committee membership

The following organizations were represented on the Technical Committee on *Tourism and Hospitality* (RSB/TC 033) in the preparation of this standard.

Ministry of Youth and Culture

Institute of National Museum of Rwanda

Commission for the Fight against Genocide

Rwanda Development Board

Standards for Sustainability

Rwanda Development Board

International Tours and Travel Ltd

Life Long Education Group Ltd

Lemigo Hotel

I3-Consultancy Ltd

Rwanda Standards Board (RSB) – Secretariat

Conservation of cultural heritage — Part 2
General requirements for design of showcases for exhibition and preservation of cultural property

1 Scope

This Committee Draft specifies general requirements for design of showcase for safe and secure display of cultural heritage objects by reducing environmental interaction and complying with the requirements for better preservation.

2 Normative references

There are no normative references in this document

3 Terms and definitions

For the purposes of this standard, the following terms and definitions apply

3.1

accessibility

physical capability of intervention in a showcase for such purposes as handling of an object, technical intervention and maintenance

3.2

air exchange

airflow through gaps and small openings of the display space to the outside of the closed showcase

3.3

buffer

material, which resists change of relative humidity, acidity, or pollutants concentration by absorbing or desorbing vapours, gases or ions

3.4

display space

space in the showcase where the objects are displayed and which may contain other elements such as panels, supports, graphics, monitoring equipment etc

3.5

indoor climate

description of climate inside the building relevant to the preservation of an object or to human comfort

3.6

microclimate

climate in the display space of the showcase

3.7

mounting

action or set of actions undertaken to allow an object to be supported or fixed

3.8

pollutants

gaseous or particulate chemical contaminants induced into the environment, which can generate corrosion, incrustation, colour fading, soiling, deterioration or other forms of damage to the object on display

3.9

safety

pertaining to human health, in the context of enclosures, ensuring they are physically stable and cannot topple, have safety glass that cannot be broken easily, do not generate atmospheres within them that are hazardous to health during usage or similar

3.10

security

protection against theft and physical damage

3.11

showcase

enclosure of any dimension, designed to protect, preserve and display objects in specific safe and secure conditions

NOTE The term “display case” is sometimes used as a synonym.

3.12

support

construction, material or device to hold and support an object without interference or damage and designed to provide stability to an object

4 Functions and Criteria for design or selection of a showcase

4.1 Functions of the showcase

4.1.1 Showcase shall display an object.

4.1.2 Showcase shall protect an object.

4.1.3 Showcase shall preserve and minimize damage to and deterioration of an object.

4.2 Criteria for design or selection of a showcase

The design, the adaptation or the choice of a showcase shall be determined by the nature of the objects, the characteristics of the exhibition area and by the need of showing an object in safe and secure conditions, while at the same time providing the conditions needed for the preservation of the object.

NOTE It is necessary to take into account:

a) the characteristics of the object:

   1) dimensions (height, width, depth) and weight,

   2) physical, chemical, and structural nature,

   3) brittleness and sensitivity in relation to its past material history,

   4) monetary value and the attractiveness of the object for thieves;

b) Management policies for collections and objects:

   1) frequency of turnover or rotation of objects between storage and display,

   2) duration of exhibition,

   3) handling of objects,

   4) maintenance of the showcase and emergency planning;

c) maintenance and interior cleaning of the showcase as this shall be safe and easy to carry out without danger to the objects;

d) placement of the object in the context of the exhibition;

e) the design and display requirements, including aesthetic considerations relevant to the appearance and the viewers' perceptions of the content;

f) the showcase and the public in relation to stability, safety, security, sufficient space for circulation, lighting;

g) environmental characteristics of the area, where the showcase will be located:

1) room,

2) building,

3) geographical environment (e.g. vibrations from traffic, seismic activity, flooding);

h) the placing or removal of the object observing security and without risk to the object itself, nearby objects or the staff;

i) sustainability:

1) the future use of the showcase, including its usability for other displays, whether complete or by using its components.

2) the carbon footprint of its materials and production processes,

3) the suitability of systems and components for maintaining the required environmental criteria (e.g. use of fans or other air conditioning devices or the re-conditioning of buffer materials).

5 Construction of the showcase

5.1 Components of the showcase

5.1.1 General

A showcase should consist of:

a) a display space for the objects, including security devices;

b) technical compartments with devices for control of environmental factors (lighting, microclimate, pollutants, etc.), and security devices;

NOTE A showcase should consist of one or more technical compartments.

c) a base or mounting of the showcase to ensure stability; and

d) lining of the display space and supports for the object.

5.1.2 Display space

5.1.2.1 The display space presenting the object shall be surrounded by walls, of which at least one (minimum) is transparent.

5.1.2.2 The dimensions of the display space shall take into account the size of the object, its preservation needs, supports and mountings, the accessibility and other exhibition elements such as panels and graphics, etc.

5.1.2.3 The contact between the leaf, door or opening panel and the frame shall maintain an appropriate seal.

5.1.2.4 The opening shall give sufficient access to the display space for safe handling of the objects and maintenance of the display space. The showcase shall remain stable during opening and when it is fully opened.

5.1.2.5 The display space shall provide room for the installation of sensors/devices to monitor the microclimate or other internal environmental factors and facilitate the collection of data.

5.1.2.6 Display space shall be secure.

5.1.3 Technical compartments

5.1.3.1 The technical compartments shall be defined as that part of the showcase, where the required devices dedicated to control of environmental factors (lighting, microclimate, pollutants, etc.), and security are located.

5.1.3.3 The technical compartment (excluding compartment for buffer materials and climate control devices) shall be isolated from the display space and the objects.

NOTE In order to reduce the risk of transfer of heat, pollutants or vibrations produced by components in the technical compartment (light, climate, etc.), it should be isolated from the display case. If necessary, it has its own ventilation.

5.1.3.4 The technical compartments may be accessed separately for maintenance without allowing access to the display space.

5.1.4 Base and mounting of the showcase

5.1.4.1 The base shall be strong and large enough to ensure the stability and balance of the showcase. If this is not possible, the showcase shall be fixed to the floor or the wall or shall be weighted to increase stability.

NOTE Mounting of the showcase takes into account the weight of the showcase, its contents and the quality of the substrate (e.g. wall or floor).

5.1.4.2 The base, plinth or any other form of mounting shall limit vibrations transmitted from floors or walls into the display space.

5.1.5 Lining of the display space and supports for the object

5.1.5.1 All linings and supports in the display space should be chemically stable, if relevant pre-tested for non- emission of harmful vapours and be easy to maintain and/or replace.

5.1.5.2 The supports shall maintain the physical integrity and chemical stability of the objects, without exerting undue pressure, tension or torque. The object together with its support shall be stable by using a system of fixing that holds the objects static even in case of vibrations.

5.1.5.3 The contact between the object and the support shall be insulated with an intermediate material of appropriate density and texture.

5.2 Characteristics of constituent materials

5.2.1 Contact with or interaction between objects and the materials of the showcase should be carefully considered.

NOTE Not all materials are suitable for long-term use with objects.

5.2.2 The materials shall not react with objects. The materials used to construct the showcase, e.g. the structure, glazing, inserts, varnishes, sealants, adhesives, paints, textiles, etc. shall be selected on the basis of professionally recognized materials testing protocols or, less reliable, by checking any available documentation (e.g. compliance certificates, technical reports).

NOTE The criteria to be considered according to the conditions under which the objects are put together with the materials are:

a) contact between objects and materials;

b) the confined environment of the showcase with reduced air exchange between the inside and outside.

5.3.4 Where harmful vapours emitted by materials or by objects present in the showcase may accumulate. The constituting materials should be carefully considered and selected. Organic glazing materials (mainly polymethyl methacrylate) and some others products are electrostatic and shall not be used for objects with pulverulent surfaces and avoided in case of dusty environments or dusty exhibits.

5.3 Assembly and fixing

After the final assembly of a showcase, mainly where adhesives, sealants, varnishes, coatings or paints have been used, appropriate time shall be given in order to ensure proper curing time and degassing.

Note This is done in order to avoid chemical pollution inside the display space.

5.4 Security and safety

5.4.1 The assembly of the showcase shall preserve the same degree of resistance as that of the glazing.

5.4.2 The non-glazed parts shall have a mechanical resistance at least equivalent to the resistance of glazing. When the leaf is located on a side, accessible to the public, it should be closed by a secure system.

5.4.3 Antitheft screws should be used to secure the display space and they shall not be dismountable with commonly available hand-tools.

5.4.4 If the showcase can be lifted and easily carried away, it should be securely fixed.

5.4.5 The choice of glazing should be made according to the level of security required by the objects.

5.4.6 In case of particularly attractive collections or collections of high value, the showcase shall be equipped with a certified shock or warning device.

NOTE The alarm should be an acoustic alarm, an independent alarm or an alarm using cable or radio links to the centralized warning system of the establishment.

5.4.7 Security and safety should be enhanced by the fixing of the showcase to the floor or to a wall.

NOTE It is necessary to take into account the balance between security and safety and emergency removals in case of fire, flooding or other natural or human caused disasters.

6 Management of the environmental conditions

6.1 Microclimate

6.1.1 General

6.1.1.1 The display space in a showcase constitutes a microclimate, which shall be assessed and controlled, and, if required, permanently monitored.

6.1.1.2 The temperature and relative humidity levels required by objects located in the same showcase shall be similar or at least compatible; for that reason objects with very different requirements shall not be installed in the same showcase.

6.1.1.3 Where appropriate, the materials used in construction of the showcase shall be allowed to acclimatize before use.

6.1.2 The indoor climate of the room and the microclimate in the showcase

6.1.2.1 When the microclimate of the showcase needs to be different from the indoor climate of the room, the sealing shall be tight and the showcase shall be equipped with passive or active control devices, which makes it possible to adjust and maintain selected levels of temperature and relative humidity.

6.1.2.2 The climate control shall be designed after assessing the environmental factors in the room and in the showcase, including monitoring of relative humidity and temperature.

6.1.2.3 Active control equipment, such as dehumidifiers, humidifiers and air-conditioning units require an electric supply and may also need water supply or means of automatic water management. Periodic maintenance is necessary and should be planned.

6.1.2.4 Passive control involves the use of buffering materials and/or thermal insulation. Periodic maintenance is also necessary and should be planned.

6.1.2.5 Buffering material should be placed within the display space or in a technical compartment.

NOTE The capacity of the compartment and the type and quantity of buffering material will depend on the volume of air within the case and on the range of acceptable relative humidity variability.

6.1.2.6 A way of controlling the flow of air between the display space and the technical compartment shall be provided.

6.1.2.7 Facilitating the replacement of buffers should be envisaged as part of the design of a new showcase or as an improvement of an existing showcase. The installation of the buffers is done at the time of closing of the showcase.

6.1.2.8 Buffers should be used by exposing them with the largest possible exchange surface to allow that excess moisture in kair is adequately absorbed or, vice-versa, released from the buffer to the air.

6.2 Lighting

6.2.1 General

6.2.1.1 The sensitivity of objects to visible light, infrared and ultraviolet radiation should be considered when choosing lighting in the showcase. The type of light, the conditions (site, power and exhibition time), and other characteristics may differ from one case to another.

6.2.1.2 In the case of a system which produces heat, this equipment shall be located outside the showcase or in a technical compartment (preferably above the display case), correctly ventilated, without any contact with the display space volume to avoid any diffusion of heat into this space.

6.2.2 Management of light

In the case of a showcase with artificial light, the exposure time and the level of lighting should be controlled by using a light control system and dimmable lamps. If visual discomfort exists, this should be avoided by using anti-reflection or anti-glare panes or by appropriate choice of the light sources and their position.

6.2.2.1 Follow-up and maintenance of light

In order to ensure a consistent quality of the light and to reduce maintenance and handling, light sources with long life span (e.g. electroluminescent diodes, fluorescent tubes with UV filters or fibre optic systems) should be used.

6.3 Pollutants, dust and microorganisms

6.3.1 If necessary, the display space or the technical compartment shall include materials to absorb gaseous pollutants from the outside or volatile organic compounds (VOC) from the showcase, or objects. this absorption shall be made with passive devices, e.g. activated carbon, activated alumina, textiles containing micro particles of metal, or via adapted filters and a forced circulation of the air in the showcase.

6.3.2 Periodic maintenance for the substitution of absorbing materials is necessary and should be planned for.

6.3.3 Dust shall be controlled by using a showcase with a low air exchange rate or, in the case of a forced air circulation in the showcase, with appropriate filters. Mould growth shall be controlled by means of an appropriate level of relative humidity.

6.3.4 The display space shall have traps for pest management and shall periodically be emptied to avoid attraction of other pests.

7 Location and maintenance of the showcase

7.1 Location of the showcase

7.1.1 The showcase shall be located in an appropriate and safe position, which does not affect the microclimate, the concentration of pollutants or the lighting level in the display space.

7.1.2 The location of the showcase should provide stability. The showcase should not obstruct the flow of visitors, the movement of equipment or emergency procedures.

7.2 Maintenance of the showcase

Periodic maintenance of showcases should be planned in order to verify the conditions of the case, gaskets and other materials that could reduce the efficiency of the showcase. In particular, aged gaskets and poorly fitting doors may increase the air exchange rate dramatically over time.

Bibliography

[1] ISO 11799:2015 *Information and documentation — Document storage requirements for archive and library* materials, 2015

[2] BS EN 16893:2018 *Conservation of cultural heritage — Specifications for location, construction and modification of buildings or rooms intended for the storage or use of heritage*

[3] RS 0: 2019 *Standard for Standards, 2019*

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