

Interior space in accommodation areas of cruising hotels according to international security and safety standards

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Introduction

Designing the floating hotels inner spaces requires special consideration to be taken. Its movements, weather, and stress exerted on its body are all factors affecting interior design elements including; the design itself as well as the materials selections. Without overlooking the aesthetic shape. Selection of all elements should be done in accordance with the international Standards to be light in weight and moisture, ignition, noise, fire resistant.

Keywords

Floating hotels, Accommodations, Standards.

Research Problem

Unawareness of most designers with the design criteria for the inner spaces of floating hotels.

Research significance

The research highlights the importance of relating the interior design and its elements with the global standards in respect of lodgers' safety and comfort.

Research Terminology

1- Accommodation Areas

Includes cabins, halls, dining areas, recreational rooms, medical facilities and other public spaces.

2- Floating Hotels

A mobile tourist facility that contains the means of subsistence and comfort depending on many variables, including the size of the hotel, the length of the cruise, the category of water in which it sails, the quality of guests and other variables.

3- Standards

Specific standards for objects assessment. Specific standards are to be applied to the elements of interior design in floating hotels in terms of security and safety, to assess the whether they fulfill the requirements of life safety or not.

Scope of the Research

1- Safe areas and spaces for transport and accommodation of passengers

1.1 Unsafe areas for passenger transportation

Specific standards are to be applied regarding passenger's transportation through different points on decks, and precautions for them regarding transportation near fuel depot or flammable liquid storage areas.

1.2 Maximum number of passengers

The number of passengers allowed to board the floating hotel is the minimum number of passengers meeting the requirements of balance, clear deck space requirements and seating requirements.

1.3 Allowed spaces for passengers

Not more than 3 floors including the top deck and allows only one surface below the waterline surface.

1.4 Non space areas

passengers' cabins and crew cabins; public baths; stairs; escape routes and any corridor should be less than 750 mm wide, areas of utilities and equipment and areas designed for safe operation.

1.5 Handrails and supports in open accommodation areas

The minimum height of the protective fences is 1000 mm above the deck and is designed to prevent any passengers from climbing or falling.



Figure (1) Fences on weather decks

1.6 Stair railings

Specific standards are applied regarding the stair's width, material and should be free from obstacles.



Figure (2) Stair railings

2- Interior design elements and materials used in accordance with international standards of life safety.

2.1 Maximum number of passengers

The internal partitions of the hotel shall be made of iron. Also, the so-called Lining / partition wall panels can be used.

2.2 Non-flammable panels for interior walls

Three used sections are hard core panels, soft core panels and metal sandwich panels.

2.3 Solid Core Wall Panels (Solid Interior Wall Panels)

They are widely used in important parts of public areas emanating from accommodation areas.

2.4 Non-flammable internal hard-core wall panels

Vermiculite is used as the core of solid non-flammable interior wall panels.

Raw vermiculite: It is one of a 2:1 group of phyllosilicate minerals consisting of magnesium silicate, aluminum and aqueous iron that contain water molecules within its stratified structure.

Exfoliated Vermiculite: It is a product of what is called “exfoliating process” in which heating raw vermiculite results in defect in vermiculite silicate layer.

Uses and properties of Exfoliated Vermiculite:

Due to being lightweight, thermal insulator, high porosity, water insoluble; organic solvents, non-toxic and good absorber, it is therefore used for fire protection and high temperature insulation.



Figure (3) Raw vermiculite



Figure (4) exfoliated vermiculite

2.5 Soft core walls panels (soft inner wall panels)

Non-flammable soft interior wall core

Mineral wool: One of the oldest types of insulation, consisting of naturally fireproof and non-flammable stone wool and can with stand temperatures up to 1000.

Uses of Mineral wool: As a heat and fire insulator among the living area and non-hot surface areas, and as a fireproof core for sandwich panels that are used to construct walls.



Figure (5) Glass wool as soft inner wall panels

Sandwich panels:

The core materials of sandwich panels can be grouped into four groups: Foam and Foam, Honeycomb, Corrugated, Wood and Foam and Foam

To form a sandwich.

structure consists of two thin panels from the outside, called facades attached to a thick core material in the middle.



Figure (6) Honeycomb core



Figure (7) Foam core

Characteristics of sandwich panels: Lightweight, physical strength, rupture properties, non-flammable, UV fading resistance, and being washable.

2.6 Different coatings for wall panels

CPL (continuous pressure laminate), HPL (high pressure laminate), (finish foil), (wooden veneer), (wallpaper), (Vinyl wallpaper), (mural wallpaper), (paintable wallcoverings).



Figure (8) continuous pressure laminate CPL



Figure (9) Vinyl wallpaper

2.7 Bathroom wall coating

The used material should achieve the standards of weight, strength, tear resistance, non-flammability, resistance and possibility of washing.

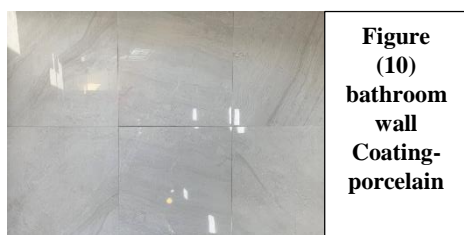


Figure (10) bathroom wall Coating-porcelain



Figure (11) bathroom wall Coating-Corian

Flooring - Materials of the under layers of floors

Used to fill low-lying areas or to lean towards drainage ducts, to adjust joint welds and under most cladding materials and to settle bent deck surfaces. These include latex mastic - light system, multipurpose latex, magnesium oxychloride, scratch-resistant cement and polymeric resins.

Characteristics of under layers' material: Light weight with good adhesive strength, resistance to oil fires, moisture resistant, corrosion resistant and high shock resistance.

2.8 Flooring – Final finishing

Materials used in flooring shall comply with the SOLAS and IMO specifications such as Ceramic, porcelain, Corian, carpet, marble and granite with minimal thickness. The Jacuzzi is also constructed in the lower areas with waterproofing of teak wood or waterproof plywood panels using special flexible adhesives.

2.9 Ceilings

Classification: continuous ceilings; which are used in corridors and crew areas. Roofs of slabs or strips; which are used in the main public rooms. Customized roofs are usually curved roofs. Iron mesh roofs, and the roof may be perforated or non-perforated.

Function: To create space for ventilation, lighting, diffusers, speakers, manholes and water sprinklers.

Installation: Performed with the aid of frames, cornices, bearing components, suspension rails, etc. to support or connect the roof finishing materials to the structure.

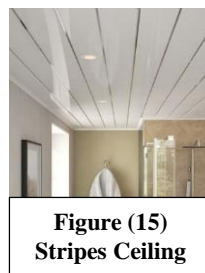


Figure (15) Stripes Ceiling



Figure (16) Grid Ceiling

2.10 Lighting

For long time light sources were fluorescent lamps or incandescent lamps. Later on, it was necessary to improve energy performance for local light use and for this reason, the fluorescent lamp was replaced by LED Light-Emitting Diodes.

The lighting design should provide adequate lighting for the comfort and well-being of lodgers as well as for various recreational activities involving lodgers on ships board.



Figure (17) Some types of LED bulbs

Lighting Criteria for Passenger Spaces:

Spaces	Illuminance Level in Lux	Spaces	Illuminance Level in Lux
Entrances and Passageways			
Exterior Walkways, Passageways, Stairways and Access Ways (night)	100	Interior Walkways, Passageways, Stairways and Access Ways	100
Muster Area	200	Embarkation Area	200
Corridors in passenger cabins and staterooms	100		
Cabins, Staterooms, and Sanitary Spaces			
Bath/Showers (General Lighting)	150	General Lighting	150
All other Areas within Sanitary Space (e.g., Toilets)	200	Reading and Writing (Desk or Bunk Light)	500
All other Living Spaces	150	Mirrors (Personal Grooming)	500
Light During Sleep Periods	> 30	Lounge/Recreation Areas within Cabin Spaces	200
Dining Spaces & Recreation Areas			
Coffee Shop, Cafeteria	500	Dining Room	300
Fine Dining	100	Vending Machine Area	75

2.11 Furnishing

Interior design standards for furniture: lightweight, removable, assembled – disassembled, stable and cost effective. Fixed furniture must have sufficiently strong structural integrity to prevent any damage to the ship itself, the passenger or the cargo on board.

2.11.1 Furniture for accommodation areas with limited risks

Areas with furniture are of limited risk are entirely made of certified non-flammable materials, except that a flammable veneer of not more than 2 mm can be used on the work surface of such materials. Upholstered furniture should

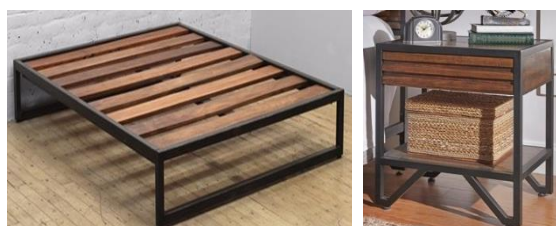


Figure (18) different models of furniture made of hollow light weight metal

be resistant to flame and flame spread, as specified in accordance with the International Code for the Application of Fire Testing Procedures.

2.11.2 Furniture for stairs and walkways in passenger' ships

Furniture in the staircase shall be limited to seats only and shall be fixed and shall be limited to six seats in each staircase compartment on each deck and shall be restricted by the fire hazard specified in accordance with the international code for the application of fire testing procedures.

2.12 Upholstery

2.12.1 Fabrics

High strength, non-combustion or stretching, wrinkle resistance fabrics should be used. Examples include: Fiber Glass, Spectra, Polyester, Nylon.

2.12.2 Curtains

Should be flame resistance and not less than that of wool with a mass of 0.8 kg / m². according to the international code for the application of fire testing procedures.

2.12.3 Carpets and rugs

Dyes used with carpets must be light resistant, friction and saltwater resistant in case of sailing in saltwater. Carpets and rugs must also be made of 100% wool or its equivalent as determined by the flame spread rate of not more than 75, and a smoke rate of not more than 100, when tested in accordance with ASTM or have a critical radiation flow of at least 0.8 watts per square centimeter (18 British thermal units per hour per square inch) when tested in accordance with ASTM E 648.



Figure
(19)
Fiber
Glass



Figure (20) Axminster
Carpet



Figure
(21)
Nylon

2.13 Doors

Standards applied to door systems includes:

- Watertight, vertically oriented, operable from both sides, door shafts are of strong structure and provide 12.7 mm (0.5 in) frieze. There should be available means of ensuring that the doors are closed in the correct order.
- Considerations should be taken if water hoses are installed in the lower corner of the door opposite to the hinge.
- The door shall not be cut from the bottom or raised more than 12.7 mm (0.5 in) above the deck or cladding of the deck.
- Carpet or rug shall not be present at the entrances and is replaced with linoleum and similar materials.
- Doors in escape corridors should generally be opened in the direction of the escape route, except for the doors of personal cabins.

2.14 Windows

Standards applied to window systems includes:

- Windows or air outlets shall be of hard or laminated glass (security glass) with a minimum thickness of 6.5 mm (0.25 inches)
- Windows or air outlets at barriers adjacent to corridors shall not extend below a point of 910 millimeters (36 inches) above the surface unless anti-intrusion bars are installed.
- Windows or air inlets in class A partitions shall be provided with steel frames or similar material.

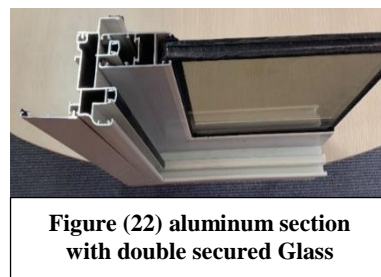


Figure (22) aluminum section with double secured Glass

2.15 Ventilation system

Standards applied to window systems includes:

- Air supply and return air (exhaust) systems are the most common ventilation systems and mechanical systems in which fresh air is supplied directly to the living space. Another way for ventilation is via air distributor where grills are placed in the cabin door for air return.
- The main entrances and exits of all ventilation systems must be closed from outside the ventilated areas.
- The access device must be easily accessible and present in a permanent and prominent location.
- The steel pipe (air conditioning duct) that penetrates the boundaries of the Class A fire barrier should be at least 11 USSG, and the steel pipe that penetrates the boundaries of the Class B firefighting barrier or deck penetrator should be at least 16 USSG.

Performance standard required for interior finishing materials

Generally, it should fulfill the right visual appearance with the right space, texture and color function with user requirements. Finishing materials must be resistant to mechanical effects and must be selected according to their resistance properties.

Findings and Conclusions

The following are concluded from the research:

- 1- The importance of the safety and security of lodgers in floating hotels as well as the safety and security of the floating hotel itself and this is evidenced by the laws and standards issued by the international bodies concerned in this regard.
- 2- Designing the interior space of the floating hotel and selecting the design elements according to international standards decreases the risks to the hotel or the people on board to the minimum.

The following are recommended:

- 1- Any standards consistent with international standards in the safety of life, standards for interior design elements, must be strictly adhered to.
- 2- Enlisting the expertise designers owing the solid knowledge of laws, standards and regulations and banning those who work to achieve the aesthetic side at the expense of safety, security of lives and facilities.

3- Continuous updating of knowledge with new materials that meet the requirements of the interior design of floating hotels.

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