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General Technical Specification for the Interior Decoration Material of Mobile Laboratory

移动实验室内部装饰材料通用技术规范

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General Technical Specification for the Interior Decoration Material of Mobile Laboratory

1 Scope

This Standard specifies the terms and definitions, product classification, technical requirements and test methods for interior decoration materials of mobile laboratories.

This Standard applies to interior decoration materials for mobile laboratories used on land.

2 Normative References

The following documents are essential to the application of this Document. For the dated documents, only the versions with the dates indicated are applicable to this Document; for the undated documents, only the latest version (including all the amendments) is applicable to this Document.

GB 6566-2010 Limits of radionuclides in building materials

GB/T 11942 Colorimetric methods for color building materials

GB 18581-2009 Indoor decorating and refurbishing materials - Limit of harmful substances of solvent based coatings for woodenware

GB 18582-2008 Indoor decorating and refurbishing materials - Limit of harmful substances of interior architectural coatings

GB 18585-2001 Indoor decorating and refurbishing materials - Limit of harmful substances of wallpapers

GB 18586-2001 Indoor decorating and refurbishing materials-Limit of harmful substances of polyvinyl chloride floor coverings

GB 19489-2008 Laboratories - General Requirements for Biosafety

GB/T 22412 Aluminum-plastic composite panel for ordinary decoration

GB 50346-2004 Architectural and technical code for biosafety laboratories

GJB 150.10A-2009 Laboratory environmental test methods for military materiel - Part 10: Fungus test

GJB 150.11A-2009 Laboratory environmental test methods for military materiel - Part 11: Salt fog test

SJ/T 11294 General specification of floor coating for electrostatic protection

3 Terms and Definitions

For the purposes of this Document, the following terms and definitions apply.

3.1 Interior decoration material

Decorative materials that are used for interior decoration of shed panels, wall panels, and floors in mobile laboratories.

3.2 Wave

The wavy texture or concavity on the decorative surface.

3.3 Spot

Local defects in coating of decorative surface.

3.4 Bubble

The local bulges on the decorative surfaces and floors made of non-metallic materials.

3.5 Scratch

Line-like marks that are caused by scratches on the surface of a material by some sharp object.

3.6 Crease

The material cannot return to its original flat state after excessive bending, leaving color marks.

4 Product Classification

4.1 Classification by type of mobile laboratory

According to different types of mobile laboratories, they are divided into four categories: decoration materials for physical mobile laboratories, decoration materials for chemical mobile laboratories, decoration materials for biological mobile laboratories and decoration materials for comprehensive mobile laboratories.

4.2 Classification by decorative parts

4.2.1 Shed panel

The shed panel refers to the ceiling area inside the laboratory, which provides top protection space and environmental space for the staff, experimental equipment, and test objects in the internal working area. Its decoration can be completed at the same time as the top wall of the mobile laboratory cabin, or it can be decorated separately.

4.2.2 Side wall panel

The side wall panel refers to the wall part inside the laboratory, which provides side protection space, isolation space, environmental space and equipment fixed support for the staff, experimental equipment, and test objects in the internal working area. Its decoration can be completed at the same time as the side wall of the mobile laboratory cabin, or it can be decorated separately.

4.2.3 Floor

The floor refers to the ground area inside the laboratory, which provides bottom load-bearing space, equipment fixation space, and personnel activity space for the staff, experimental equipment, and test objects in the internal working area.

4.3 Classification by material properties

4.3.1 Metal materials

Various types of metal or metal alloy sheets and profiles that meet the performance requirements of laboratory interior decoration materials.

4.3.2 Non-metallic materials

Various types of polymer sheets, Boeing films, wallpapers, liquid materials and other materials that meet the performance requirements of laboratory interior decoration materials.

4.3.3 Composite materials

Various metal and non-metal hybrid plates and profiles with laboratory interior decoration material properties.

5 Technical Requirements

5.1 Specifications

5.1.1 metal composite materials sheets and profiles shall meet the following requirements:

a) Material dimensions comply with technical drawings;

b) Sheet with adhesive layer on the back, the thickness of the adhesive layer is 0.055mm ± 0.01mm;

Material hazardous substance limits:

a) Painted materials: volatile organic compounds (VOCs) content ≤ 200g/L, free formaldehyde content ≤ 0.1g/kg;

b) Wallpaper, Boeing film materials: free formaldehyde release ≤0.12mg/m^3;

c) Floor leather: it shall comply with the provisions of GB 18581-2009.

5.4.9 Acid and alkaline resistance

The material shall be soaked in hydrochloric acid (10%) and sodium hydroxide (10%) solutions for 24 h. The surface of the material shall not leave permanent traces or discolor.

5.4.10 Water absorption

The material shall have non-absorbent properties, or the overall strength and shape shall not change after absorbing water.

5.4.11 Anti-static performance

Non-metallic floor materials can quickly discharge electrostatic charges; and the surface resistivity reaches 10^5~10^9Ω. The ground resistance discharge shall comply with the requirements of SJ/T 11294.

5.4.12 Antibacterial and anti-mildew properties

The material shall have the function of inhibiting the vegetative bodies or propagules of microorganisms such as bacteria and mold, and the production level of mold shall be level 0~2.

5.4.13 Antibacterial, anti-mildew and durable performance

The material has antibacterial and mildew-proof properties after being washed, and the mold production level shall be level 0~2.

5.4.14 Salt spray resistance

Material coatings or protective layers provide effective protection in salt spray environments. Under the salt spray with an exposure time of 96 h, the test piece is not allowed to have coating peeling, corrosion and other performance degradation and deterioration that affect the use function and service life.

5.4.15 Hardness

Pencil hardness of non-metallic materials is ≥1H.

6 Test Methods

6.1 Specifications

6.1.1 The total thickness of the material, the thickness of the top paper and the thickness of the backing paper are measured using a spiral micrometer. When measuring the thickness of a product with an adhesive layer, wipe it repeatedly with absolute ethanol to remove the adhesive layer, and then measure. The thickness of the adhesive layer is calculated by subtracting the thickness of the top paper and backing paper from the total thickness.

6.1.2 Use a ruler or tape measure to breath and length.

6.1.3 Measure at least 10 points for each item, and take the average as the final value.

6.2 Appearance quality

6.2.1 Inspection of material appearance quality is conducted by visual inspection under natural light conditions (illuminance is about 300lx). Unfold the material and stand it on its side. The angle between the material and the horizontal plane is 70°±10°, and visually inspect it at a distance of 3m from the center of the material. For various defects detected visually, use a ruler with an accuracy of 1mm to measure their maximum size. The inspection requires two persons, and the person who draws and places the samples does not participate in the inspection.

6.2.2 The special requirements for the appearance quality of the entire cabin after decoration shall be inspected in accordance with the provisions of GB 19489-2008 and GB 50346-2004.

6.3 Chroma

Use an instrument to measure color difference according to the method in GB/T 11942.

6.4 Performance

6.4.1 Dimensional stability (material shrinkage)

In a room temperature environment, place the material with a size of 300mm×300mm (Boeing film needs to be pasted on the aluminum plate, and the liquid floor material is poured on the aluminum plate) at room temperature for 24 h. Draw a cross-shaped vertical cross line in the center of the material, which shall penetrate the surface of the material.

Then place the sample in the high and low temperature test chamber, and heat the test chamber. When the temperature in the test chamber stabilizes at 70°C ± 2°C and continues for 24 h, then the temperature is lowered to room temperature. During the test, the temperature change rate when raising and lowering the temperature shall be no greater than 2 °C/min. After the test, measure the maximum slit width of the cross-shaped vertical intersection line.

6.4.2 Adhesion

deformation and crack.

6.4.5 Low temperature resistance

At room temperature environment, place a sample with a size of 300mm × 300mm (Boeing film is pasted on the aluminum plate, liquid floor material is poured on the aluminum plate) at room temperature for 24 h; and then the sample is placed in a high and low temperature test chamber. Cool down the test chamber until the temperature in the test chamber reaches -55℃±2℃ and stabilizes, continue for 24 h; and then return the temperature to room temperature. During the test, the temperature rise and fall rate shall be no greater than 2°C/min. Visually inspect material delamination, blistering, cracking, deformation and other changes; detect color changes according to the method in 6.3; and detect adhesion according to the method in 6.4.2.

6.4.6 Flame retardancy

Cut the material into 50mm×50mm squares; place them horizontally; and use a match or lighter to light from one corner of the square. After a few seconds, remove the flame.

6.4.7 Contamination resistance

6.4.7.1 Dip the wall specimens (Boeing film needs to be pasted on the aluminum plate) into various substances in 5.4.7, respectively. Take it out after 24 h; rinse the remaining material on the surface with tap water; dry it naturally; and detect the color change according to the method in 6.3.

6.4.7.2 Floor materials (liquid materials need to be solidified) are cut into 50mm wide strips; coated with lubricating oil and immersed in gasoline, engine oil, and diesel, respectively. After 24 h, the color change is detected according to the method in 6.3.

6.4.8 Limits of hazardous substances

It shall be carried out in accordance with the methods specified in the limits of hazardous substances in GB 6566-2010, GB 18581-2009, GB 18582-2008, GB 18585-2001 and GB 18586-2001.

6.4.9 Acid and alkaline resistance

Soak the specimens (Boeing film needs to be pasted on the aluminum plate, liquid floor material poured on the aluminum plate) in hydrochloric acid solution (10%) and sodium hydroxide solution (10%) respectively; take them out after 24 h; and use tap water to remove the residual substances on the surface. Rinse off and dry naturally. Then compare it with the material that has not been immersed in these substances, and detect the color change according to the method in 6.3.

6.4.10 Water absorption

Take a small sample of the material and place it in water for 5 min. Visually check whether

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