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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 50725-2011

**Standard for construction and acceptance of liquid crystal
display manufacturing equipment installation engineering**

液晶显示器件生产设备安装工程施工及验收标准

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1 General provisions

1.0.1 The standard was drawn up in order to regulate the construction and the acceptance of installation works for liquid crystal display device production equipment, and to secure the reliable operation of the equipment once installed.

1.0.2 It applies to the construction and acceptance of installation engineering for liquid

crystal display device production equipment.

1.0.3 Besides this standard, the construction and acceptance of such installation works shall also comply with the relevant national standards in force.

2 Terms

2.0.1 Liquid crystal display device (LCD): a passive light-emitting display device which performs its display function by modulating external light, the modulation coming from the change of the arrangement of the liquid crystal molecules of a liquid crystal substance in an electric field.

2.0.2A Utilization: the ratio between the quantity actually produced by the equipment in unit time and the theoretical maximum production quantity.

2.0.3 Polarizer: an optical material that lets polarized light of a given direction pass through, used to produce and to detect polarization.

2.0.4A Probability of miss: the missed inspection ratio or the missed inspection probability. The missed inspection ratio is the percentage that the nonconforming items not found during an inspection event represent of the total quantity of the batch inspected on that occasion. The missed inspection probability is the probability, when a given sampling method is used for the inspection, that nonconforming items are not drawn, or that the proportion of nonconforming items in the sample does not agree with their actual proportion in the whole batch.

2.0.5A Fallout ratio: the ratio between the number of conforming items wrongly judged nonconforming and the total number of conforming items among the products sampled on that occasion.

2.0.6A Soft to hard (STH): the process flow by which optically clear adhesive is bonded onto the cover glass.

2.0.7 Hard to hard (HTH): the process flow by which the cover glass that has undergone soft bonding is bonded to the display module in accordance with the process requirements.

In the 2024 edition the clauses numbered 2.0.2, 2.0.4, 2.0.5 and 2.0.6 are marked as deleted, and the clauses 2.0.2A, 2.0.4A, 2.0.5A and 2.0.6A listed above stand in their place.

3.1 General requirement

3.1.1 Equipment shall be installed and set in place according to approved technical documents; any modification of those technical documents shall carry the approval of the corresponding unit.

3.1.2 The handling equipment and the tools used shall be intact, reliable and safe, and shall

be checked and confirmed before use.

3.1.3 Operating personnel shall have received the corresponding training and shall hold the corresponding qualification certificate; personnel in special trades shall in addition hold the corresponding work permit.

3.1.4 The environmental conditions for equipment installation shall satisfy the requirements of the design documents, the process documents, the technical standards and the equipment operating manual.

3.2 Storage of equipments before installation

3.2.1 The warehouse in which liquid crystal display device production equipment is stored shall comply with the following: it shall be clean, dry and ventilated, and free of corrosive media; the ambient temperature shall be 10 °C to 30 °C; the relative humidity shall be below 80 %; the height of the space and the height and width of the doors shall allow the largest outer packing case of a single item of equipment to be carried in; the requirements of the electrostatic protection operating system shall be met; the floor shall be level and shall carry the load of a forklift moving the heaviest item, and a forklift passage shall be left for taking equipment out of store; fire protection facilities shall be arranged in accordance with the relevant provisions of the current national standard GB 25201; and where the storage of the production equipment carries temperature and humidity requirements, those requirements shall be met as well.

3.2.2 The storage of the equipment shall comply with the following: it shall be stored according to a drawn equipment layout plan, arranged in ordered rows and columns and marked with position numbers; packages shall be stacked on sleepers raised 300 mm above the floor, shall never be inverted, and shall not be stacked higher than 4.5 m; and equipment shall not be stored together with corrosive, flammable or explosive goods, nor be placed near sources of ignition.

3.3 Construction conditions

3.3.1 The following technical documents shall be available for the installation of the production equipment: the production equipment installation layout drawing; the equipment list and the equipment packing list; the technical documents for installation, operation and maintenance and the installation technical parameters supplied by the construction unit or by the equipment manufacturer; the load bearing parameters of the raised floor and the load bearing parameters of the floor along the equipment transport route; the construction organisation and the construction scheme; and, where the equipment carries micro-vibration control requirements, the fabrication drawings of the anti-micro-vibration foundation and of the independent foundation.

3.3.2 Before the equipment is installed the clean plant shall comply with the following: the

as-built acceptance shall have passed and the air cleaning conditioning system shall have run normally for more than 24 h; the lighting system shall already be working normally; the personnel cleaning rooms, air showers included, shall be in service and shall be managed by designated staff under the clean plant management rules; the vibration characteristics of the building structure shall have been tested, analysed and accepted, and the anti-micro-vibration facilities shall have been tested and accepted; the fire protection facilities inside the plant shall have passed their special acceptance and shall be in service; the lightning protection and earthing facilities shall have passed their special test and acceptance; and the electrostatic protection facilities of the electrostatic protected work area shall have passed their special test and acceptance.

3.4 Construction preparation

3.4.1 Construction personnel entering the clean plant shall be given training on equipment installation work in a clean plant and shall obtain a pass for entering the clean area; work carried out inside the clean room shall follow the management requirements strictly. Personnel in special trades such as riggers, welders and electricians shall hold the certificates required by the relevant provisions.

3.4.2 The use and the management of the lifting and transport machinery employed to install and move liquid crystal display production equipment shall comply with the relevant provisions of the current national standard GB 6067 and, in addition, with the following: outdoor handling machinery shall be in good working order, safe and reliable, and where the load allows it nylon or polyamide slings shall be used; where the capacity of nylon or polyamide slings does not meet the weight of the equipment to be lifted, wire rope sheathed in nylon hose shall be used as the sling; when a temporary platform is built for carrying equipment in, the side of the platform shall be longer than the long side of the largest equipment packing case, a safe working area shall be left, the platform as a whole shall slope slightly towards the interior, shall be level with the indoor floor, and its surface shall be flat; machinery used for installation in the clean area shall be machinery dedicated to the clean area, its exposed parts shall not generate dust or measures shall be taken to prevent dust from contaminating the environment, and it shall not be used interchangeably with machinery for non-clean areas.

3.4.3 The materials used to install equipment in the clean room or clean area shall comply with the following. The first five requirements read: the clean room shall use materials that are dust-free, rust-free and grease-free and that do not shed dust in use; the carbon steel sections used to make independent equipment foundations and to strengthen the floor shall be given a dust-proofing treatment; equipment shim plates shall be made to the requirements of the design or of the equipment technical documents; stainless steel expansion bolts shall carry a product conformity certificate, and stainless steel chemical anchor bolts shall carry a product conformity certificate and an instruction sheet as well;