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Replacing 20314-2006

Thin float glass for liquid crystal display (LCD) applications

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Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This Standard replaces GB/T 20314-2006, *Thin float glass for LCD applications*. Compared with GB/T 20314-2006, the major technical changes are as follows:

-- it changes terms and definitions (see Clause 3; Clause 3 of 2006 edition);

-- it changes classification based on quality grades in the original standard into classification based on quality requirements (see Clause 4; 4.1 of 2006 edition);

-- it changes thickness classification (see 5.2; 4.3 of 2006 edition);

-- it cancels thick-thin difference classification and changes the indexes of thickness deviations and thick-thin differences (see 5.2; 5.2 of 2006 edition);

-- it changes the indexes of dimensional deviations and diagonal difference (see 5.1; 5.2 of 2006 edition);

-- it adjusts edge defects to appearance quality requirements (see 5.3; 5.3 of 2006 edition);

-- in appearance quality: it changes the specifications of pane; integrates fog marks and tin points into point defects; integrates bruises into scratches; and adds lines (see 5.3; 5.5 of 2006 edition);

-- it cancels micro-waveness grading and changes the indexes of micro-waveness of thickness 0.55 mm (see 5.4; 5.4 of 2006 edition);

-- it changes the indexes of warp of thickness 0.55 mm (see 5.5; 5.4 of 2006 edition);

-- it changes the test methods for appearance quality, micro-waveness and warp (see 6.5, 6.6 and 6.7; 6.2, 6.4, 6.6 and 6.7 of 2006 edition);

-- it adds the clause of inspection type and changes the clause of acceptance quality limits for sampling and some required items (see Clause 7; Clause 7 of 2006 edition);

-- it deletes Annex A (see Annex A to 2006 edition).

This Standard was proposed by China Building Materials Federation.

This Standard shall be under the jurisdiction of National Technical Committee 447 on Industrial Glass and Special Glass of Standardization Administration of China (SAC/TC 447).

Thin float glass for liquid crystal display (LCD) applications

1 Scope

This Standard specifies the terms and definitions, classification, requirements, test methods, inspection rules, packaging, marking, transport and storage of thin float glass for liquid crystal display (LCD) applications.

This Standard applies to soda-lime-silica thin float glass for TN-LCD and STN-LCD with the thickness not greater than 1.10 mm.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition dated applies to this document. For undated references, the latest edition of the referenced documents (including all amendments) applies to this document.

GB/T 1216, *External micrometer*

GB/T 2680, *Determination of light transmittance, solar direct transmittance, total solar energy transmittance and ultraviolet transmittance for glass in building and related glazing factors*

GB/T 2828.1-2012, *Sampling procedures for inspection by attributes – Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

GB/T 8170, *Rules of rounding off for numerical values and expression and judgement of limiting values*

GB/T 9056, *Metal ruler*

GB 11614-2009, *Flat glass*

GB/T 15764, *Standard terminology of flat glass*

GB/T 18680-2002, *The transparent conductive glass with indium-tin oxide films used in liquid crystal display*

JB/T 2369, *Reading microscope*

SJ/T 10793, *Terms for glass used in electronic applications*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply, in addition to those defined in GB 11614-2009, GB/T 15764, GB/T 18680-2002 and SJ/T 10793.

3.1

TN-LCD

Liquid crystal display of the twisted nematic type.

3.2

STN-LCD

Liquid crystal display of the super-twisted nematic type.

3.3

edge defects

Cracks, bulges, missing parts, etc. of glass pane, including chips, edge irregularities, missing angles and so on.

3.4

micro-waveness

Degree of tiny unevenness of glass pane.

3.5

warp

Misfit between glass surface and reference plane, which is expressed as degree of warp.

4 Classification

Classified into grades A and B in accordance with the quality requirements.

Light transmittance of thin float glass for LCD applications shall not be less than 91%.

6 Test methods

6.1 Dimensional deviation

As specified in 6.1 of GB 11614-2009.

6.2 Diagonal difference

Measure the length of two diagonal lines as specified in 6.2 of GB 11614-2009. The percentage of the difference of diagonal line lengths to the average length of diagonal lines is the diagonal difference.

6.3 Thickness deviation

Use an external micrometer of division value 0.001 mm as specified in GB/T 1216 to measure 5 points in the direction perpendicular to the stretching direction of glass pane, including one point inwards about 15 mm from the edge respectively and three points equally dividing the distance between the two points. Round the measure values off to the third decimal place. The difference between actual value and nominal thickness is the thickness deviation.

6.4 Thick-thin difference

Use the same method specified in 6.3 to measure the thicknesses of 5 different points of a glass pane; calculate the difference between its maximum value and minimum value.

6.5 Appearance quality

6.5.1 Point defects, intensity of point defects, scratches, optical spot distortions, lines, surface cracks and surface stains

6.5.1.1 After washing and drying, transfer sample to a dark room of 100,000 grade's cleanliness. The light intensity of the test point is 2,500 lx; the distances from the light source and the observing position are 300 mm respectively; observe sample at any random angle against the matt black-white background, through reflected light [as shown in Figure 1a)] and transmission light [as shown in Figure 1b)].

6.5.1.2 On an ambient light detector, 300 mm apart from the test point, observe sample at any random angle.

6.5.1.3 Use a microscope of division value 0.001 mm as specified in JB/T 2369 to measure the maximum dimensions of point defects and the widths of scratches. Use a metal ruler of division value 1 mm as specified in GB/T 9056 to measure the minimum

7.2.4.2 Batch criteria

7.2.4.2.1 During the inspection of appearance quality, refer to the sample quantities in Table 5; if the rejected quantity of pieces is less than the rejected quantities in Table 5, then the batch of product is acceptable for the item.

7.2.4.2.2 During the inspection of dimensional deviation, diagonal difference, thickness deviation, thick-thin difference, micro-waveness and warp, if the results comply with the requirements of corresponding clauses, then the batch is acceptable for the corresponding items.

7.2.4.2.3 During the inspection of light transmittance, if the test results are as specified in 5.6, then the batch is acceptable for the item.

7.2.4.2.4 If the above-mentioned 7.2.4.2.1, 7.2.4.2.2 and 7.2.4.2.3 are met, then the batch is acceptable; or else, it is rejectable.

7.3 Type inspection

7.3.1 General rules

Type inspection shall be carried out in one of the following cases:

a) during the commissioning of a new product or the finalization evaluation of a product;

b) when production is resumed after a cold repair of melting furnaces;

c) when there is any significant change in raw materials or technological parameters;

d) when there is any significant difference between the result of exit-factory inspection and that of last type inspection;

e) at least once each year during normal production.

7.3.2 Inspection items

The items of type inspection are as in 7.2.1.

7.3.3 Batch

As in 7.2.2.

7.3.4 Sampling

7.3.4.1 During the inspection of appearance quality, as in 7.2.3.1.

7.3.4.2 During the inspection of dimensional deviation, diagonal difference, thickness

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