



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

GB/T 6546-2021

**Corrugated fibreboard - Determination of edgewise crush
resistance**

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1 Scope

This Standard specifies the method for measuring the edgewise crush resistance of corrugated fibreboard using the edge-free wax method.

This Standard is applicable to various corrugated fibreboard.

2 Normative references

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

GB/T 450, Paper and Board - Sampling for Testing and Identification of Machine and Cross Direction, Wire Side and Felt Side (GB/T 450-2008, ISO 186:2002, MOD)

GB/T 10739, Paper, board and pulps - STANDARD atmosphere for conditioning and testing (GB/T 10739-2002, eqv ISO 187:1990)

ISO 13820, Paper, board and corrugated fibreboard -Description and calibration of compression-testing equipment

3 Terms and definitions

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

3.1 edgewise crush resistance

the maximum force value per unit length of the specimen when the corrugated cardboard specimen is subjected to increasing pressure along the corrugation direction, until the specimen is crushed

4 Principle

The rectangular corrugated fibreboard specimen is placed between the two

8.2 Use a suitable sampler (5.2). Cut a sufficient number of specimens from the undamaged area of the sample (8.1). Ensure that 10 valid test results can be obtained. The height of each specimen (parallel to the direction of the corrugation) is (25.0 ± 0.5) mm. The length (perpendicular to the corrugated direction) is (100.0 ± 0.5) mm. The compressed edge of the specimen shall be cut clean and straight, and meet the requirements of 8.3.

8.3 Each specimen shall be inspected for quality. The inspection content is as follows:

- a) The width of the specimen shall not change more than 0.1mm along the length.
- b) Use the visual method to judge the cleanliness of the cut edge of the specimen. When inspected under normal laboratory conditions (fluorescent lamp, no magnifying glass), there is no obvious deformation of the corrugation, no fluffing or obvious loose fibers at the cutting edge.
- c) Straightness, parallelism and perpendicularity can be judged by the following steps:

Place the two specimens on the same flat plate with the cut edge facing down, so that the specimens are almost face-to-face in contact. Ideally, the opposing surfaces of the two specimens shall be absolutely flat, and the planes on which they are located shall be parallel to each other. But in the actual test, the flat plate tends to be bent to a certain extent. When the specimen is placed vertically on the flat plate with the bottom cut edge, the top cut surfaces of the two specimens are flush and parallel to each other, at right angles to the adjacent plane, and the cut edges of the specimen are on the same plane, at this time, it can be considered that the quality of the specimen meets the requirements of the test. When a load of about 1N (equivalent to a light finger pressure) is applied to the top edge of the specimen, there shall be no light through the bottom cut edge.

Then take any two specimens to inspect according to the above method.

NOTE: The quality of the specimen cut may have a significant impact on the test results.

Therefore, it is necessary to check the quality of the specimen with the highest possible

standard.

9 Test steps After the upper and lower pressure plates of the fixed pressure plate compression tester (5.1) are separated, place any side of the specimen with a length of 100mm in the middle of the lower platen. Put a guide block (5.3) on both sides of the specimen to support the specimen. When the tester pressure

Annex A (informative) Precision data

The repeatability and reproducibility data comes from an international circular comparison conducted by CEPI-CTS in 2011.

The statistical calculation basis is ISO/TR 24498 and TAPPI T 1200.

The repeatability standard deviation reported in Table A.1 is the combined repeatability standard deviation, that is, the standard deviation calculated using the root mean square of the standard deviations of all participating laboratories.

This is different from the traditional definition of repeatability in ISO 5725.

The reported repeatability limit and reproducibility limit are the maximum difference between the two sets of test results obtained from the same material under the same test conditions, and the maximum difference is not evaluated at a 95% confidence rate. This evaluation is invalid for different materials or different test conditions.

The repeatability limit and the reproducibility limit are calculated by multiplying the repeatability standard deviation and the reproducibility standard deviation by 2.77.

NOTE 1: The repeatability standard deviation is equivalent to the laboratory standard deviation. However, the reproducibility standard deviation is different from the inter-laboratory standard deviation. The reproducibility standard deviation includes both the inter-laboratory standard deviation and the intra-laboratory standard deviation. That is:

NOTE 2: , it is assumed that the test results are normally distributed and the standard deviation s is obtained based on a large number of tests.

Repeatability In laboratory In laboratory Inter-laboratory Reproducibility but