

Testing the mechanical properties of cardboards and cardboard packaging



In our laboratory we have devoted ourselves primarily to the testing and certification of finished shipping containers. The exception is testing the mechanical properties of cardboards.

Our work is grounded in the authorisation of the Ministry of Transport and certification in transport packaging for dangerous goods and the relevant accreditation.

These measurements are especially required in disputes about the quality of the supplied packaging between supplier and customer, where CIMTO plays the role of the third independent part.

Measurements and technical parameters

The result of the measurement of the mechanical properties of cardboards is a **Statement of the Accredited Testing Laboratory**, not a certificate. The declaration includes stated measured results and, on the basis of the customer's requirements, can be matched with the **methods of FEFCO** (the European Association of Manufacturers of Corrugated Board) or according to German standards **DIN 55468-1 and 55468-2**. The test is normally carried out on 10 samples from the supplied test material.

The most important technical parameter of the majority of packaging made from corrugated cardboard is its carrying capacity (represented by the acronym BCT). This parameter is measured in the laboratory on a large press. For this value, however, the edge crush test (ECT) is also essential, as well as the specific design of the packaging. **Bursting strength (BST)** is important mainly for packaging containing loosely packed solid, sprinkled, or unfixed goods.

Performed measurements and standards used:

- determination of basis weight – ČSN EN ISO 536,
- determination of strength of edge crush test (ECT) – ČSN EN ISO 3037,
- determination of strength in bursting (BST) – ČSN EN ISO 2759,
- determining the basis weight of each layer after delamination – ČSN ISO 3039,
- the resilience of the cardboard crates against the compression (BCT) – ČSN EN ISO 12048,
- water absorption according to $Cobb_{60}$ and $Cobb_{1800}$,
- the thickness of the corrugated board.

In examining the mechanical properties of cardboard, is important to take into account some of the aspects that fundamentally affect the quality of the cardboard or carton packaging. Some of these aspects are also presented in the conclusion of our **Statement**.

During processing, partial degradation of physical properties of the material can occur due to contact with mechanical elements, cutting tools, and printing plates. These changes in the material have a negative effect on the resulting measured values in the range of 5-7% according to the type of the manufacturing technology used.

Storage conditions:

Storage conditions are essential for long-term maintenance of the constant physical properties of the cardboard. If it does not comply with the storage standard for corrugated cardboard (**18 - 23°C, 50 - 60%RH**), it is not possible to equate its physical properties with the declared properties of the material at the time of its production.

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