



Quality characteristics of cartonboards

The subsequent “quality characteristics” have been jointly established by the Vereinigung Maschinenkarton (Industry Sector Cartonboard) in the German Pulp and Paper Association (VDP) and the Fachverband Faltschachtelindustrie (Folding Carton Association). They are intended as *guidelines* for the cartonboard manufacturing and converting industries, and shall be applicable independently of any relevant standard conditions of sale, which shall remain binding excepting any tolerances given for supplied quantities.

Requirements related to special applications (board materials for food packaging, toys etc.) shall be laid down separately.

All quality characteristics refer to *minimum quantities* of 2.5 t of the ordered format, standard grade and grammage.

All *measuring devices* used to test or determine the quality characteristics described herein shall be calibrated according to applicable standard regulations.

These quality characteristics became effective on 26 March 1998, rendering the agreement of 14 March 1991 ineffective.

Grade categories and grammages

The subsequent quality characteristics apply to the *grade categories* of Coated Cartonboards (grades GZ, GN1, GN4, GC1, GC2, GT1, GT2, GT4, GD1, GD2, GD3) and Uncoated Cartonboards in (grades UZ, UN4, UC1, UC2, UT1, UT2, UT4, UD1, UD2, UD3).

Paperboards upgraded by any off-machine process, for example cast coated (AZ, AC1 etc.) or plastic coated grades, are covered by separate standard regulations.

Grammages range from 200 g/m² to 600 g/m².

Order/supply quantity tolerances

Order quantities in t	Tolerances in % of the order quantity
≤ 1 t	± 20 %
1 – 2.5 t	± 15 %
> 2.5 - 5 t	± 7.5 %
≥ 5 t	± 5 %

Order types

Quantity within the tolerances given.

The supply quantity shall be within the range given above. Example: order quantity 3 t, supply quantity 2.775 to 3.225 t.

Quantity not below an agreed minimum quantity.

Supply quantity is the minimum quantity plus an extra not exceeding the permissible range. Example: order quantity 3 t, supply quantity 3 to 3.45 t.

Quantity not exceeding an agreed maximum quantity.

Supply quantity is the maximum quantity minus an amount not exceeding the permissible range. Example: order quantity 3 t, supply quantity 2.55 to 3 t.

Sampling to deal with complaints

Supply quantity (no. of units)	No. of pallets/reels to be tested	No. of test sheets per pallet/reel
1 - 5	all	1
6 -19	5	1
20 -99	10	1

Except for supply quantities of one to five units, the pallets/reels to be tested shall be selected at random. The number of measurements is defined by the relevant testing standards.

Pallets: Do not take samples from the top ten sheets of the pallet. Reels: Samples shall be taken between the third and fifth turns.

Samples shall be taken according to DIN EN ISO 186.

Sample preparation and test climate

Prepare the samples at a temperature of 23°C and 50% relative humidity (according to DIN EN 20187).

Test the samples at a temperature of 23 °C and a relative humidity of 50 % according to DIN 50014.

Class 1: ± 1 °C and ± 3 % rel. humidity.

Grammage

Permissible range: Average of the consignment ± 2.0 % of the nominal value (ordered grammage).

Testing according to DIN EN ISO 536 (samples as delivered).

Note: Compliance with the moisture contents defined under the standard climate conditions will lead to grammage variations that must be taken into account during final assessment.

Caliper

Permissible range: ± 5 % of the nominal value.

95 % of all measured values shall be within the permissible range, i.e. shall not exceed ± 5 % of the target value.

Tests shall be carried out according to DIN EN 20534.

Bending stiffness

Permissible range: - 15 % of nominal stiffness

95 % of all measured values shall be above the lower limit.

Determine the bending stiffness of each test piece both upwardly and downwardly, and calculate the average from these two values as the final bending stiffness.

Testing according to DIN 53121 (method based on the beam principle):
Test piece width: 38.1 mm; free length: 50 mm; bending angle: 5°;
or conditions according to DIN 53123-1 (resonance method).

Moisture content

Relative humidity:

Standard values for grammages of up to 400 g/m²: 45-60 % rel. humidity;
above 400 g/m²: 50-65 % rel. humidity.

Tests shall be carried out at 20°C, using an electronic hygrometer.

Absolute moisture content:

Permissible range: ± 1 % absolute of the nominal moisture content.

Testing according to DIN EN 20287.

pH (surfaces)

Permissible range: > 4.5, maximum 10.

Testing according to the Zellcheming technical information sheet V/17/80 issued by the German Association of Pulp and Paper Chemists.

Cobb number (water absorption)

Permissible range: top side (coated) 20-50 g/m² (water absorption),
reverse side 20-200 g/m².

Testing according to DIN EN 20535.

Plybond

The bonding strength of top layers shall be sufficient for normal offset printing conditions.

Levels of plybond strength shall suffice for typical converting processes.
Requirements exceeding these typical levels (e.g. for upgrading processes) must be specified when placing the order.

Testing according to DIN 54516.

Creasability

Creasing shall be carried out such that liner splitting is avoided; internal crease rolls shall be evenly formed.

Testing according to DIN 55437.

Trimming

Sheets should be cut with equipment which ensures that there is a minimum amount of loose fibres adhering to the edges.

Sheet-size tolerances

Dimensions shall not be smaller than specified. Accuracy: max. + 3 mm, or + 0.3 % for any dimension larger than 100 cm. To be tested using a measuring table.

Maximum angular deviation: 2 mm per 100 cm length of cut. To be tested using a measuring table.

Stacking characteristics

Adequate flatness - no wavy edges - adequately wave-free sheets - no warped or dished sheets.

To be checked visually.

The temperature of the cartonboard should be allowed to adjust to that of the converting environment before the original wrappers are removed.

To avoid misunderstandings, use the »List of cartonboard defects« issued by the IRD (Institute for Efficient Management in the Printing Industry) for all tests and evaluations.

Issued by the Fachverband Faltschachtel-Industrie e.V. (Technical Association of Folding Carton Manufacturers, FFI),
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