

Technical Specifications. Packing material

These Technical Specifications apply to packing material.

Packing material may be of a single-layer or a multi-layer type, it may have a pattern applied using flexographic and/or digital printing methods, or have no pattern.

Packing material is intended to be used for packing and labeling of various types of food products including infant foods, perfumery and cosmetic products, chemical products, toys, children's products, household products, disinfectants, other manufacturing and technical products and fast moving consumer goods, as well as for other purposes.

1. Main Parameters and Characteristics

1.1 Main parameters and dimensions of a web and rolls shall comply with the regulations stated in Table 1.

Table 1

Parameter	Characteristics (norm, tolerance), Inspection Method
1. Description	Packing material shall comply with the requirements of these Technical Specifications and Terms of Reference and be manufactured according to a Proof coordinated with a customer and in accordance with the manufacturing process approved as per established procedure. Packing material is manufactured in the form of webrolls wound on a cardboard tubes
2. Roll weight	Not exceed 40 kg, not exceeding 250 kg
3. Roll diameter	Not exceed 600 mm. Tolerance by Terms of Reference -10%
4. Sheet width, mm:	Compliance with nominal value established by Terms of Reference <ul style="list-style-type: none"> • for high stretch-resistant materials (High stretch-resistant materials include materials having warp tensile strength of 70 MPa or higher) Tolerance by Terms of Reference ± 1 mm; • for low stretch-resistant materials (Low stretch-resistant materials include materials having warp tensile strength of up to 70 MPa) Tolerance by Terms of Reference ± 3 mm
5. Inside diameter of tube	(70 \pm 1) mm, (76 \pm 1) mm or (152 \pm 1) mm
6. Cardboard tube length, mm	Compliance with a web width. Tolerance of Reference +2mm
7. Weight of 1 m ² , g:	For average value: <ul style="list-style-type: none"> • up to 42, inclusive Tolerance by Terms of Reference $\pm 7\%$ • more than 42 Tolerance by Terms of Reference $\pm 10\%$
8. Coil winding quality	Rolls shall be tightly wound and their side surfaces shall be smooth and even. Web corrugation within the roll layers at the maximum distance of 50 mm from the tube is allowed.
9. Web shift at and of a roll, mm	Compliance with a web width tolerance. Tolerance by Terms of Reference ± 1 mm

Parameter	Characteristics (norm, tolerance), Inspection Method
10. Technological joints	<p>Number of joint per roll does not exceed three. It is allowed to produce rolls with more than three joints but no more than 3 rolls per job.</p> <p>The joints must be done on both sides by adhesive tape, edge-to-edge, without any distortions of a printed pattern and a text. The length of a repeat spliced shall be the same as the length of the repeat with an allowed variation of +/- 1 mm.</p> <p>At a customer's request, a splice section may be marked by a marker extending the end of a roll</p>
11. Visual appearance	<p>The film should not have through holes, stains, spots, folds, wrinkles, edges, adhesion of individual layers, mechanical damages to the bobbins. The film should be easily unwound.</p> <p>The packing material may have a slight wrinkle of fold unifixed.</p> <p>On section near the joints and near tubes on a web there may be isolated sections with pressed folds, air bubbles between material layers or sections with pattern shift if they have the length of no more than 5 m. The number of such sections in a batch of packing material should not exceed ten.</p>

1.2 Packing material quality characteristics shall comply with the regulations stated in Table 2.

Table 2

Parameter	Characteristics (norm, tolerance), Inspection Method
1. Color reproduction accuracy	<p>Compliance of a production print to a Proof approved as per established procedure or a reference sample. Deviations within established standard values attributed to variations of optical properties of materials of different batches.</p> <p><u>Inspection Method:</u> Visual. Measurement by spectrophotometer.</p> <p>Measurement procedure and Tolerance by Terms of Reference As per item 2.1, Table 4 of these Technical Specifications</p>
2. Alignment accuracy of inks and varnishes on a print, mm	Compliance of a production print to an approved layout original. Tolerance by Terms of Reference ± 0.3
3. Geometrical dimensions of an image, mm	<p>Compliance with nominal dimensions established by Terms of Reference:</p> <ul style="list-style-type: none"> • for high stretch-resistant materials. Tolerance by Terms of Reference ± 1.0; • for low stretch-resistant materials. Tolerance by Terms of Reference ± 6.0
4. Ink impression clarity	<p>Absence of stripes, spots, foreign ghosting.</p> <p>Isolated speckles of half-tone dots not affecting a design are allowed</p>
5. Image breaks	<p><i>Compliance of a production print to an approved Proof.</i></p> <p><i>Breaks not obstructing text and small element readability are allowed.</i></p> <p><i>Image breaks maximum 2 mm, at full splicing joint width are allowed</i></p>
6. Sharpness of a text and small elements	<p>Compliance of a production print to an approved Proof.</p> <p>Breaks not obstructing text and small element readability are allowed</p>

Parameter	Characteristics (norm, tolerance), Inspection Method
7. Lamination strength, H/15mm Depending on physical and chemical properties of original materials and weight of the product to be packed	For the weight of the product to be packed: <ul style="list-style-type: none"> • up to 50 g Standard Value more than 0,6 H/15mm; • at 50 to 300 g Standard Value more than 0,8 H/15mm; • over 300g Standard Value more than 1,2 H/15mm <u>Measurement:</u> Pull test machine as per active technological regulations providing load variation with the relative accuracy of $\pm 10\%$ and clamp travel speed of (100 ± 10) mm/min.
8. Heat sealing temperature range °C Depending on the structure of packaging material	115-150 °C <u>Measurement:</u> Heat sealing machine as per active technological regulations. The positive result is the result where the inner layers of material are sealed within the selected temperature range
9. Weld strength, H/15mm	Standard Value more than 2,5 H/15mm <u>Measurement:</u> Pull test machine. Test at a temperature of 125 ° C, a pressure of 400 N, a contact time of 1 sec.
10. Ink coat adhesion, %	No ink transfer to the test adhesive tape. Tolerance by Terms of Reference not exceed 15% <u>Inspection Method:</u> as per item 2.2 of these Technical Specifications
11. Abrasion resistance	Absence of ink coat transfer. Weak coloration of filter paper without change of color of an unvarnished print <u>Inspection Method:</u> as per item 2.3 of these Technical Specifications
12. Crease resistance, %	Absence of ink coat flaking. Tolerance by Terms of Reference Ink coat flaking: <ul style="list-style-type: none"> • for packing with a protective varnish layer not exceed 3; • for packing without a protective varnish layer not exceed 10 <u>Inspection Method:</u> as per item 2.4 of these Technical Specifications
13. Resistance ink to low temperatures, % (for packing material with a protective varnish layer)	Absence of ink coat damage. Tolerance by Terms of Reference not exceed 3% <u>Inspection Method:</u> as per item 2.5 of these Technical Specifications
14. Resistance to the effect various reagents (acid, alkali, soap, fat, etc.)	<u>Inspection Method:</u> ISO 2836:2004 "Graphic technology -- Prints and printing inks -- Assessment of resistance of prints to various agents" After the test the specimen is checked for delamination, ink migration of filter paper and color change of the ink coat. Absence of ink coat damage. Insufficient coloring of filter paper.

1.3 Packing material may be additionally treated to give to it specific properties. Types of additional treatment:

- reprint images: selective image varnishing; holographic image printing (Cast&Cure);
- printing of variable information (promotion codes).

Quality characteristics of additional treatment of packing material shall comply with the regulations stated in Table 3.

Table 3

Parameter	Characteristics (norm, tolerance), Inspection Method
1. Holographic images / Reproduction accuracy	Compliance with the type approved in Terms of Reference and with the drawing approved Proof
2. Alignment accuracy, mm (MD-machine direction/ TD-transverse direction)	Compliance of a production print to an approved Proof or a reference specimen approved as per established procedure. <ul style="list-style-type: none"> - for reprint images with a main image Tolerance by Terms of Reference ± 1.0; - for reprint images applied in several stages, with a main image Tolerance by Terms of Reference ± 1.5 - for promotion code with a main image Tolerance by Terms of Reference MD/TD $=\pm 15 / \pm 5$
3. Image breaks in reprint image elements	Compliance of a production print to an approved Proof. Tolerance by Terms of Reference: breaks not obstructing text and small element readability are allowed
4. Ink coat adhesion, %	Absence of ink coat transfer. Tolerance by Terms of Reference not exceed 15% <u>Inspection Method:</u> as per item n, 2.2 of these Technical Specifications
5. Resistance ink layer to low temperatures, %	Absence of ink coat damage. Tolerance by Terms of Reference not exceed 3% <u>Inspection Method:</u> as per item 2.5 of these Technical Specifications

2. Main measurement procedure

2.1 Evaluation of Delta E parameter - color reproduction accuracy

Image color reproduction accuracy evaluation is carried by ISO 12647 – 6: Process Control for the Manufacture of Half-Tone Color Separations, Proof and Production Prints. Part 6: Flexographic Printing.

Delta E is a calculated rate reflecting quantitative deviation of a reproduced printed color from a color standard. A Proof, a Reference Specimen (RS) or other reference sample coordinated with a customer are understood as a color standard in each specific case.

Equipment and materials:

- a spectrophotometer as per active technological regulations with the capacity to perform measurements using the following settings: DIN 16536/ D50/ 2° / NOPOL / ABS. Delta E Formula – Delta E (2000);
- Standard white backing LENETA (FORM 2A);
- Pantone catalog.

Measurements are performed by means of a spectrophotometer in appropriate elements of control patches which are located in a print area or in appropriate control points marked on Proof.

Color deviation (Delta E) on packing material shall not exceed tolerances stated in Table 4.

Table 4

Ink Composition of a Tested Area / Measurement	Color Standard	Delta E Color Deviation
CMYKOVG1 / for each ink, no color overlay	Proof	< 3
CMYKOVG / color overlay	Proof	< 6

Ink Composition of a Tested Area / Measurement	Color Standard	Delta E Color Deviation
CMYK/ color overlay	Proof	< 4
CMYK / color overlay, pitch modification	Proof	< 5
Mixed inks ² / for each ink, no overlay	Pantone catalog	< 3
Two and more mixed inks / overlay	Pantone catalog	< 3

Notes:

1 CMYKOVG: Process color inks: C - Cyan, M - Magenta, Y - Yellow, K - Black; Multi-color inks: O - Orange, V - Violet (or Blue), G - Green.

2 A mixed ink is a pantone ink that includes several inks of varying colors to obtain the required hue.

2.2 Ink coat adhesion check

Equipment and materials: adhesive tape Tesapack 4104 as per active technological regulations having the width of 50 mm and adhesion strength of 9.0 N/25 mm (36.7 g/mm).

Measurements are performed on three sheets. Number of areas for measurements per sheet shall not be less than three.

A tested sample is placed on a table, then stretched and secured by hand.

The adhesive tape is applied to the tested sample and the sample is strongly stroked two or three times with a tape roll. After 2 minutes, one end of the tape is strongly taken by the fold and without a stop half of the tape is removed in short fast movements while the second half is removed in a single fast movement.

The result where the average percentage of the damaged ink coat of all samples does not exceed tolerance stated in Table 2 is accepted as the positive result.

2.3 Test of abrasion resistance

Equipment and materials: load: scale weight with the nominal weight of 1 kg; template (250 x 200) mm, calibrated as per established procedure; laboratory filter paper.

Using the template, out of each sample no less than two specimens are cut. A piece of a filter paper is attached at the lower surface of the scale weight using double adhesive tape.

The tested specimen of packing material is placed and spread on a table with its printed side up.

The weight with the filter paper attached is placed over the tested specimen. Five reciprocating motions with the weight and the attached filter paper on it are performed diagonally over the specimen; no force should be applied to the weight vertically.

Abrasion resistance is evaluated visually, based on intensity of filter paper coloration and change of color of a printed image on the specimen.

2.4 Test of crease resistance

Specimens with dimensions of (100 x 100) mm are cut out. The quantity of specimens from each sample is no less than three.

The specimen is pressed between thumb and index fingers so that a strip with the width of approximately 35 mm is left between them. Hands are drawn together and are moved their hand in the opposite direction without applying any load to the sample for 15 cycles (each cycle consists of back and forth movement of the hands «roundtrip»).

Percentage of damaged area to the total area of the specimen is calculated. Average value of damaged section area is calculated.

2.5 Test of cold resistance of an ink coat

No less than two specimens with dimensions of (100 x 100) mm are cut out of each sample.

Specimens are placed in a glass tumbler and are put in a refrigerating chamber at temperature of minus 18°C for 16 hours. Specimens are removed and defrosted at room temperature. Specimens are tested at the moment of moisture condensation on their surface according to procedure stated in item 2.4.

3. Safety Characteristics

Safety characteristics of packing material shall comply with the requirements of Commission Regulations (EU) №1935/2004, №2023/2006, №10/2011; requirements of Directive 94/62/EB.

4. Packing and Marking

Each roll shall be tightly packed in film. Film edges shall be tucked into a tube.

A label shall be attached on the outside of every roll and the inside of every tube stating the following information: name of a manufacturer or its trade mark; product designation; transportation bundle number; roll number; net weight; gross weight; packer id; date of manufacture (date, month and year).

Packed items shall be stacked on pallets in rows and interlaid with sheets of spacing material. At top and bottom of a pallet sheets of corrugated cardboard or of a bubble film. A pallet with stacked rolls is wrapped throughout its height and upper row surface with a stretchable film, is covered with an upper cap and is secured with polymer bands. Band ends are fastened with metal or plastic clamps.

A transportation unit height shall not exceed 1.6 m and its gross weight – 1000 kg.

As agreed with a customer, other methods of packing and use of other materials ensuring quality of packing material during transportation and storage are allowed.

Labels containing the following information are fastened at two adjacent sides of a transportation unit: name of a manufacturer, its trade mark and location (legal address including country); name of a customer; product designation; identification of these Technical Specifications; transportation unit number; number of rolls per transportation unit; net weight; gross weight; date of manufacture (date, month and year); warranty period; storage conditions; conformity marks (for certified products); bar code (for products intended for wholesale or retail networks); handling signs "Keep Upright", "Do Not Use Hooks", "Keep Dry" "Keep Away From Heat".

As agreed with a customer, marking data can be changed. The requirement to change the marking must be stated in a contract.

In cases when rolls are packed using an opaque film, samples of packed products shall be attached to transportation units.

5. Acceptance Rules

Acceptance inspection of packing material is performed in batches.

A number of packing material rolls under the same name manufactured from materials of the same type (of the same kind

of material combination for laminated materials) and supported by one document of quality is considered to be a batch.

A document of quality shall include the following data: name of a manufacturer, its trade mark and address; product designation; net weight; date of manufacture; results of a test performed or confirmation of product quality compliance with regulation requirements; storage requirements.

Documents accompanying a product batch: Declaration of conformity, Document of quality (Test report) and transportation label).

6. Transportation and storage

Packing material shall be transported packaged in closed vehicles in compliance with the shipping rules applicable for this type of a vehicle. Transportation of packing material shall be performed at a temperature of no lower than minus 30°C.

Rolls of packing material shall be stored packaged indoor at ventilated warehouse facilities at temperatures of plus 5°C to plus 30°C and relative humidity of 40 - 80 %.

Packing material shall be stored at a distance of no less than 1.5 m from heating appliances and be protected from direct sunlight, moisture, aggressive chemicals and materials with a strong smell.

To prevent formation of condensate within roll turns, it is forbidden to move rolls to rooms having temperature, which is 15°C higher than ambient temperature.

7. Manufacturer Guarantees

The Manufacturer guarantees compliance of packing material with the requirements of these Technical Specifications provided that transportation and storage requirements are met. No useful (shelf) life is established for the product.

Warranty period is 12 months from the date of manufacture.