Special Technical Specifications for
Delivery and Purchase (STDP) of

Paper Beverage Bottle Labels

January 2024

Die deutschen Brauer
Deutscher Brauer-Bund e.V.

Bundesverband Druck+Medien
DEUTSCHLAND

Contents

1 Introduction

Objectives of these Special Technical Delivery and Purchase Specifications

These *Special Technical Delivery and Purchase Specifications (STDP) for Paper Beverage Bottle Labels* were agreed between the

Bundesverband Druck und Medien e.V. (BVDM)
(German Printing and Media Industries Federation),
Markgrafenstraße 15, D-10969 Berlin, Germany

as the representative of label manufacturers and the

Deutscher Brauer-Bund e.V. (DBB)
(German Brewers' Association),
Neustädtische Kirchstraße 7A, D-10117 Berlin, Germany

as the representative of the German brewing industry and are intended for manufacturers and users of labels for beverage bottles. The STDP are intended to serve as a guide for purchasers and processors of labels (hereinafter referred to as 'customers') in agreeing on the quality and thus the functionality of wet-glue labels with the label supplier (hereinafter referred to as 'manufacturer')

The STDP are to be regarded as recommendations and may be used – in full, in part or in modified form – as part of supply contracts. The non-applicability as well as contractual amendment of individual provisions in the STDP shall not affect the validity of the remaining agreements independent of these.

Importance of the quality parameters for the labelling process

The STDP defines values whose compliance is a measure of the consistent quality of the label and forms the prerequisite for a perfect labelling result. For an optimal labelling process, the machine, label and adhesive must be matched to each other. Changes or new materials should be tested for suitability under operating conditions.

Experience shows that laboratory values allow good predictions to be drawn about practical application. Nevertheless, individual practical conditions in the bottling plants can lead to deviating results and should be taken into account in advance of a project.

Application of the specified standards

Insofar as the standards to be used for quality testing (see Annex III for an overview) are specified in these STDP without a date, the version valid at the time of testing shall apply.

2 Scope of application

These STDP apply to wet-glue labels made of paper and metallised paper for use on glass and plastic beverage bottles in the single-use and reusable segments. The scope of application covers labels made of both virgin fibre and recycled paper.

The quality of labels is assessed on the basis of the quality characteristics described in these STDP and is determined by the quality requirements and test procedures specified herein.

3 General requirements

The labels must be manufactured, packaged and provided in such a way that they are suitable for bottling, packaging and distribution of the bottled goods. They must be processable at any time when handled properly and must not cause any malfunctions in the bottling lines.

4 Standardised quality requirements

4.1 Paper quality

The paper quality must be agreed between the manufacturer and the customer prior to production. Basis for this are the relevant paper specifications.

4.1.1 Grammage

Description

The grammage indicates the mass of the printing substrate in relation to its area in g/m². Depending on customer requirements and application, different masses per area may be advantageous. The grammage to be used must be agreed between the customer and the manufacturer.

Target definition

The target values can be found in the technical data sheet provided by the paper supplier. Depending on the printed image, the finished label can be expected to have an ink application of approx. 1–4 g/m² + 2 g/m² varnish application, if applicable.

Tolerance

The tolerances can be found in the technical specifications provided by the paper supplier.

Test method

EN ISO 536

4.1.2 Paper grain direction

Description

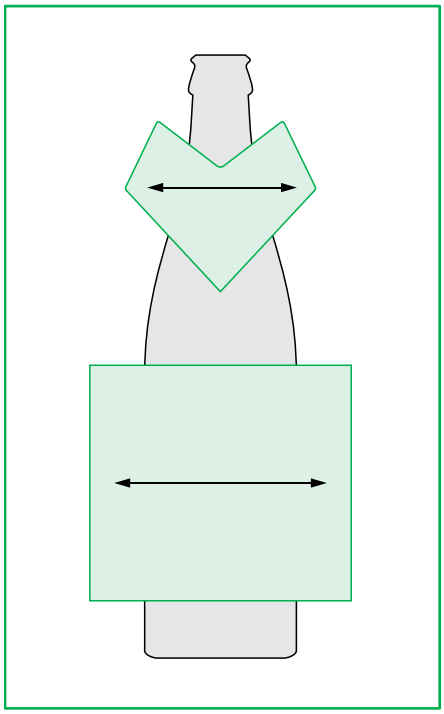
The correct paper grain direction of the labels is a prerequisite for trouble-free machine processing.

Target definition

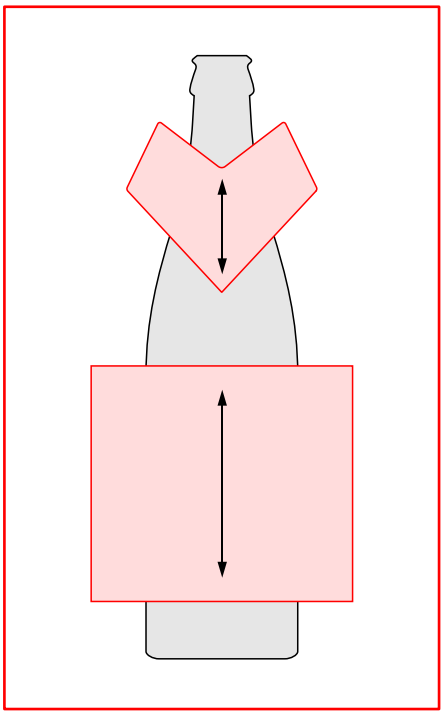
As a rule, the paper grain of the label must be perpendicular to the bottle axis (see illustration on page 6).

Tolerance

Exceptions, e. g. for swing-top caps or seal labels, require separate agreements.



Correct paper grain direction ■



Wrong paper grain direction ■

Test method

- Fingernail test:
  The edges of the paper are gently rubbed between the fingernails of the thumb and index finger. This causes the paper to form slight waves. These waves tend to be more pronounced when rubbed across the grain than when rubbed along the grain.
- Tearing test:
  Tearing the paper along the grain produces a smooth tear. Tearing across the grain produces an irregular (frayed) tear.

The test methods can be used alternatively or, in cases of doubt, as a complement to each other. A label or a retained printed sheet is tested.

4.1.3 Wet and dry tensile strength

Description

As labels are subject to increasing demands, mechanical strength plays a significant role. Wet and dry tensile strength provide an indicator of this. There are non-wet-strength, light wet-strength and high wet-strength papers. High wet-strength label papers are used for reusable bottles (see Annex I).

Target definition

The values for wet and dry tensile strength, measured lengthwise and cross-wise to the paper grain, can be found in the technical specifications provided by the paper supplier.

Tolerance

The tolerances for wet and dry tensile strength can be found in the technical specifications provided by the paper supplier.

Test method

- Dry tensile strength: EN ISO 1924-2
- Wet tensile strength: ISO 3781

If necessary, tests can be carried out using a retained sheet of paper.

4.1.4 Water absorptiveness (Cobb value)

Description

The water absorptiveness of the paper (Cobb value) is particularly important on the reverse side of the labels, as it influences the setting speed of the glue, the rolling behaviour and thus the labelling behaviour (see also Annex I).

Target definition

The Cobb value is a typical property of the respective label paper and can be found in the technical data sheet for the label paper.

Tolerance

The tolerance values can be found in the technical specifications provided by the paper supplier.

Test method

EN ISO 535

The material-specific test run times can be found in the technical specifications provided by the paper supplier. The values on the reverse side of the unprinted label paper are decisive.

If necessary, tests can be carried out using a retained sheet of paper.

4.1.5 Wet stretching

Description

The hygroscopic nature of paper leads to an inevitable swelling of the paper fibres, typically between 2.0% and 3.5%. In order to achieve a labelling result that is as free of creases and blisters as possible, the reverse side of the paper, the glue, the water load and the drying conditions must be optimally adjusted to each other.

Target definition

The target value is determined by the paper manufacturer's specifications.

Tolerance

The tolerance is determined by the paper manufacturer's specifications.

Test method

ISO 5635

If necessary, tests can be carried out using a retained sheet of paper.

4.2 Optical characteristics

4.2.1 Print image shift

Description

The print image shift is the graphic centring in relation to the centre line of the label.

Target definition

The print image should be centred without any shift.

Tolerance

A tolerance of ± 1.0 mm to the cutting/punching edge is permitted.

Test method

The print image shift is measured to an accuracy of 0.1 mm using a measuring lens.

Section 6.2 applies to sampling and assessment.

4.2.2 Register deviation

Description

The term 'register' refers to the graphic alignment of the individual printing colours.

Target definition

The individual printing colours should be printed directly upon one another without shifting.

Tolerance

A tolerance of ± 0.2 mm in and across the printing direction is permitted.

Test method

Measurements are taken using a measuring lens with an accuracy of 0.1 mm.

The measurement is taken at the register marks of a retained printed sheet.

4.2.3 Colour reproduction

Description

The appearance of labels can be approximated very well using proofs in accordance with ISO 12647-7. Spot colours are usually specified according to Pantone. Their colour coordinates are stored digitally in a library at the manufacturers' premises.

Target definition

The BVDM's ProzessStandard Offsetdruck can be used for printing with process colours. For Pantone colours, the digitally stored colour coordinates are decisive. The target colour coordinates of other spot colours can be determined by measuring physical customer reference samples. When communicating target or measured values, the underlying measurement conditions must always be specified.

The print result should correspond as closely as possible to the specifications, taking into account the printing substrate.

Tolerance

In four-colour printing with process colours, the tolerances of the Prozess-Standard Offsetdruck are considered technically unavoidable.

Spot colours can be printed with a colour deviation of $\Delta E^*_{00} \leq 4$.

Test method

Colour differences are evaluated using the CIELAB DeltaE 76 (ΔE^*_{ab}) colour difference formula for process colours and the CIELAB DeltaE 2000 (ΔE^*_{00}) colour difference formula for spot colours.

For metallised or cold transfer-finished substrates, colour reproduction can only be assessed visually.

Colour accuracy can be measured in the print control strip on the printed sheet. Measurement in the printed image is possible provided that the printing ink has not been printed in combination with other printing inks and has a homogeneous area of at least 4 mm × 5 mm.

The colour consistency of a print run can be documented by regularly taking sample sheets.

Section 6.2 applies to sampling and assessment (where applicable).

4.2.4 Other optical defects

Description

In addition to measurable deviations, there should be no other visual defects in the print image. These include hickeys (butts), scratches, ink smears, stains, etc.

Target definition

The print image should be free of optical defects.

Tolerance

A defined defect rate within the ordered quantity is permitted (see Section 6.2).

For *printing* defects that impair marketability, a lower permissible defect rate applies in accordance with Section 6.2. Such a defect also exists if it occurs in date fields for individual markings (see Section 4.3.7) and leads to the illegibility of a marking required for marketability.

After the customer has authorised printing (PDF), data errors such as 'allergens not printed in bold' or 'alcohol content incorrectly positioned' are the responsibility of the customer.

Test method

Visual inspection.

Section 6.2 applies to sampling and assessment.

4.3 Mechanical and technical characteristics

4.3.1 Dimensional accuracy

Description

Compliance with the specified dimensions (width, length) of the delivered labels is a prerequisite for trouble-free operation of the labelling machine. Labels that do not meet the specified dimensions will inevitably cause malfunctions.

Target definition

The labels should be supplied in accordance with the specified dimensions.

Tolerance

The dimensions of the labels shall be within a tolerance of ± 0.4 mm of the specified dimensions.

Test method

Measurements are taken to an accuracy of 0.1 mm using a measuring lens or electronic systems.

Section 6.2 applies to sampling and assessment.

4.3.2 Ink resistance to cleaning alkaline solutions (for reusable bottles)

Description

Reusable labels are subjected to the cleaning process of the bottle cleaning system when empty bottles are returned. To avoid causing problems there, the labels must be removed from the bottle cleaning machine in one piece and should not contaminate the cleaning solution (print image as intact as possible).

Target definition

The requirements of ISO 12632 must be met with an exposure time of 20 minutes.

Tolerance

Due to their material composition, papers containing mechanical pulp or recycled papers usually discolour the alkaline solution, turning it yellowish.

Test method

ISO 12632

4.3.3 Label removal time (for reusable bottles)

Description

During the bottle cleaning process, it should be possible to remove the labels from the bottles within a defined time.

The label removal time depends not only on the substrate and the printing ink used, but also on whether the surface has been cold/hot transfer finished or varnished, for example. Metallised papers generally have longer removal times than white papers. The type of glue and the amount applied also influence the removal time, as do the conditions within the bottle cleaning system. In particular, glues that are resistant to condensation and ice water tend to negatively affect the removal time. If the labels have an overlap, the removal time increases significantly.

The ageing/weathering of labels and glues due to unfavourable storage conditions for the empty bottles also prolongs the removal times and can lead to the labels fraying.

Target definition

During the bottle cleaning process, labels should be removed in good time to prevent contamination. Experience shows that this requirement is met if the label removal times under standardised conditions (ISO 12632) are less than 240 seconds.

Tolerance

The removal time for labels on white paper with standard ink coverage must not exceed 240 seconds.

For surface-finished labels (e. g. cold/hot transfer finished, varnished) or labels on metallised paper, a removal time of 240 seconds should not be exceeded if possible. As no generally applicable upper limit for the removal time can be specified for such labels, the specific properties of the labels and the parameters relevant to the removal time should be agreed in advance between the customer and the manufacturer.

Test method

ISO 12632

The test is performed using ST 50 KF glue.

5 labels are tested. The test result is determined by the average of the removal times measured in each case.

4.3.4 Abrasion resistance

Description

Abrasion resistance refers to the label's resistance to mechanical stress (e. g. bottles rubbing against each other). Bottles without indentations, stress in the shelf or six-packs have a particularly large influence here.

Target definition

The abrasion of the printing ink must not exceed the agreed tolerance.

Tolerance

The tolerance is agreed individually between the customer and the manufacturer.

Test method

Abrasion test (Prüfbau-Quartant)

The test samples for the wet rub test are sprayed once with a pump sprayer from a distance of approximately 25 cm and are immediately placed in the abrasion tester. The measurement is started directly after insertion.

- Wet abrasion: Number of strokes: n = 40 Weight: 0.5 N/cm²
- Dry abrasion: Number of strokes: n = 400 Weight: 0.5 N/cm²

The number of strokes specified applies exclusively to coated label papers. A single-sided coated white label paper with a grammage of 70 g/m² must be used as counter paper. All other papers require a special agreement. At least 2 labels each are tested wet/dry. The result is assessed visually using the tolerance catalogue for evaluating the abrasion resistance of beverage bottle labels (see attachment). If the test of the two labels does not produce a clear result, the test must be repeated with two further labels.

4.3.5 Curling

Description

Curling indicates how much the paper curls when it absorbs water. The influence of humidity, temperature, water, or glue is decisive for the curling of the label. Finishes can also affect curling.

Target definition

The labels may show a tendency to curl in the manual labelling test. Due to the special test conditions (wetting with *water*), the labels show a stronger tendency to curl here than when processed in the labelling machine (wetting with *glue*).

Tolerance

Assessment according to assessment scale (see illustrations on page 16):

- Front and back label: curling 1–2
- Body, neck ring and closure label: curling 1–3

Test method

One label is tested:

- Hold a clean bottle (original bottle, in the case of returnable bottles, only used glass) under running cold water for 5 seconds
- Apply the label to the bottle without glue and without pressure
- Hold the bottle, including the label, under running cold water for another 3 seconds
- After 30 seconds, assess curling (see illustrations: scale 1 = very good … 4 = poor)

Assessment: curling 1 (very good) ■

Assessment: curling 2 (good) ■

Assessment: curling 3 (moderate) ■

Assessment: curling 4 (poor) ■

4.3.6 GTIN codes

Description

GTIN codes are used by retailers and consumers to identify products.
The decodability grade depends on the substrate used and the finishing.

Target definition

The decodability of the printed codes must be guaranteed.

Tolerance

(Not applicable)

Test method

Suitable GTIN reader (compliant with ISO/IEC 15416).

Section 6.2 applies to sampling and assessment.

4.3.7 Individual markings

Description

Individual markings are necessary to indicate best-before dates and batch numbers on the label. Legibility depends on the design of the marking field and the performance of the respective marking system.

Target definition

The marking must be legible.

Tolerance

(Not applicable)

Test method

The functionality of individual marking with laser, inkjet and stamping systems should be checked in advance.

5 Storage and shelf life

5.1 Shelf life of labels during storage

Inadequate storage conditions can lead to processing problems.
Age-related colour deviations are unavoidable even with careful storage.

Storage requirements

The labels should be stored at a room temperature of 17–25 °C and a relative humidity of 40–60 %. This ensures that the labels do not lose moisture and remain flat until labelling.

Furthermore, the labels should remain in their packaging as far as possible to prevent them from drying out. Any remaining labels that are returned to the store from the bottling station should also be repackaged and not left exposed.

Guarantee of processability

If the above parameters are adhered to, the manufacturer must guarantee that the labels will remain processable for 12 months from the date of production.

5.2 Storage of labelled bottles

The manufacturer accepts no liability for defects caused by unfavourable storage conditions (e. g. frost, very high or very low humidity, direct sunlight) affecting the labels on the labelled bottles. The customer must ensure that the adhesives used are completely dry.

6 Error definition and assessment

6.1 Error definition

Error definition in measurement based-tests

From the tolerances specified in Section 4 the upper (T_U) and lower (T_L) tolerance limits for measurement-based tests are to be determined as follows:

- T_U = target value + tolerance
- T_L = target value – tolerance

When assessing colour reproduction (section 4.2.3), the colour difference in each direction of the three-dimensional colour space is the tolerance limit.

Any exceeding of a tolerance limit is considered an error.

Error definition for visual assessments

The visual inspection may identify several defects on a label; however, only the most serious defect according to the agreed AQL value (see section 6.2) is taken into account.

6.2 Error assessment

The basis for rejecting a shipment is exceeding the tolerance limits for measurements or exceeding the acceptance limits for visual inspections.

The error assessment for the test parameters according to sections 4.2.1, 4.2.3 (as far as possible), 4.2.4, 4.3.1 and 4.3.6 is based on ISO 2859-1. In order to assess a representative sample of the shipment, a defined minimum number of labels must be taken as a random sample from each pallet (containing approx. 1 million labels):

- for the test parameters according to sections 4.2.1, 4.2.3, 4.2.4 und 4.3.6
  125 labels (special inspection level S-4, code letter K)
- for the test parameter according to section 4.3.1
  50 labels (special inspection level S-3, code letter H).

In these cases, the following AQL or acceptance and rejection limits apply to quality inspections of shipments.

Section	Merkmal/Fehler	AQL	Acceptance limit	Rejection limit
4.2.1	Print image shift	1,0	3	4
4.2.3	Colour reproduction	1,5	5	6
4.2.4	Other optical defects	1,5	5	6
	• if marketability is impaired	0,10	0	1
4.3.1	Dimensional accuracy	2,5	3	4
4.3.6	GTIN codes	0,40	1	2

7 Final provisions

This edition of the *Special Technical Delivery and Purchase Specifications (STDP) for Paper Beverage Bottle Labels made of paper* replaces the March 1998 edition.

This agreement shall enter into force on 1 January 2024 and shall be reviewed as necessary to bring it into line with the technological and scientific state of the art. It shall remain valid until revoked by either of the two associations. Any amendments shall require the written consent of both associations.

Berlin, 1 December 2023

Deutscher Brauer Bund e.V.
(German Brewer's Association)

Signed: Holger Eichele
Hauptgeschäftsführer

Bundesverband Druck und Medien e.V. (BVDM)
(German Printing and Media Industries Federation)

Signed: Dr. Paul Albert Deimel
Hauptgeschäftsführer

Imprint

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brauer-bund.de

and

Bundesverband Druck und Medien e.V. (BVDM), Markgrafenstraße 15, D-10969 Berlin, Deutschland
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Annex

The following explanations supplement, clarify or expand on the content of the preceding sections. They are for informational purposes only and are therefore not binding for the application of the STDP.

I Information on paper quality

Wet/dry tensile strength: typical values

The wet strength of label papers can be classified roughly as follows based on their wet tensile strength measured in the paper direction (according to EN ISO 1924-2):

- not wet strength ≤ 3 N/15 mm
- lightly wet strength ≈ 7 N/15 mm
- highly wet strength ≥ 11 N/15 mm

The dry tensile strength of label papers, measured in the direction of paper grain (according to ISO 3781), is generally 50 N/15 mm or higher.

During the labelling process, the labels are primarily subjected to stress in the direction of paper grain (see section 4.1.2). The tensile strength perpendicular to the direction of paper grain is therefore of secondary importance in practice. Its value is lower than in the direction of paper grain.

Water absorptiveness: Significance of the Cobb value

The Cobb value serves as a measure of the water absorption capacity of label papers, which influences glue absorption and labelling behaviour. The higher the Cobb value, the more water the material absorbs. Depending on the application, the Cobb values of commercially available label papers range between 8 g/cm² and 25 g/cm² ($Cobb_{60}$, measured on the back of the paper).

On its own, this Cobb value does not say anything about the wet expansion of a label. For example, metallised papers with the same Cobb value are less likely to form creases after labelling than coated or uncoated white papers.

Additional test methods for label papers, standard atmosphere

The proportion of mechanical pulp fibres in the paper can be determined using method 3.16.19 from *MEBAK Gebinde und Produktausstattungsmittel* (Containers and Product Packaging), 3rd edition.

The paper thickness can be determined in accordance with EN ISO 534.

The smoothness/roughness of the paper can be determined in accordance with DIN 53107 (Bekk method) or DIN 53108 (Bendtsen method).

The climatic conditions for testing label papers are specified in ISO 187 (standard atmosphere):

- Temperature: 23 °C ± 1 °C
- Relative humidity: 50 % ± 2 %

II Resistance of labels to environmental conditions

Impact of sunlight on label colouration

Many types of paper contain components (e. g. lignin) that cause the paper to turn yellow when exposed to sunlight, particularly due to the UV radiation it contains. In particular, papers made of wood pulp and recycled papers can also become brittle when exposed to sunlight.

If the labels are stored and handled correctly in the bottling plant, these colour changes only occur on the labelled bottles when they are stored outdoors or indoors in daylight (e. g. in shop windows).

The extent to which discolouration of the label paper affects the colour reproduction of the printed label depends on the design. Dark solid areas are hardly affected, and cold or hot transfer finishes are not affected at all. However, pastel colours or light halftone motifs are sensitive to the yellowing of the paper.

The lightfastness of colours depends on the colour tone, the pigment used and the thickness of the ink layer.

Resistance of labels to alkaline glues

Alkaline labelling glues (pH > 7) can cause the printed colours to bleed and/or cause colour tone changes in the print image. If available for the application in question and feasible in terms of production technology, alkali-resistant printing inks can be used to avoid such problems.

Alkaline glues must not be used with metallised papers, metallic cold transfer finishes and metallic printing inks, as there is a risk of the metallised layers oxidising.

III Checking the labels

Customer complaints based on incoming goods inspections

A complaint must contain the following information:

- Type/description of the defect
- Order or production number
- Date of delivery
- Packaging markings (labels, stamps, etc.)
- Delivery quantity
- Sample size (n)
- Number of pallets from which the sample was taken
- Quantity delivered
- Size of the sample (s)
- Number of pallets from which the sample was taken
- Number of items rejected in the sample
- Sample of the rejected items

Testing institutes

External tests can be carried out by the following institutions, among others:

Versuchs- und Lehranstalt für Brauerei in Berlin (VLB)
Verpackungsprüfstelle
Seestraße 13
D-13353 Berlin
Deutschland

Fogra Forschungsinstitut für Medientechnologien e.V.
Einsteinring 1a
D-85609 Aschheim b. München
Deutschland

Sächsisches Institut für die Druckindustrie GmbH
Mommsenstraße 2
D-04329 Leipzig
Deutschland

Papiertechnische Stiftung (PTS)
Pirnaer Straße 37
D-01809 Heidenau
Deutschland

Standards referenced in this STDP

The standards and norms referred to in these STDP are listed below in the order in which they are first mentioned.

EN ISO 536	Paper and board – Determination of grammage
EN ISO 1924-2	Paper and board – Determination of tensile properties – Part 2: Constant rate of elongation method (20 mm/min)
ISO 3781	Paper and board – Determination of tensile strength after immersion in water
EN ISO 535	Paper and board – Determination of water absorptiveness – Cobb method
ISO 5635	Paper – Measurement of dimensional change after immersion in water
ISO 12647-7	Graphic technology – Process control for the production of halftone colour separations, proof and production prints – Part 7: Proofing processes working directly from digital data
ProzessStandard Offsetdruck	Wirtschaftlich und farbsicher produzieren von der Datenerzeugung bis zum Auflagendruck Bundesverband Druck und Medien e.V. (BVDM), Berlin
ISO 12632	Graphic technology – Ink, paper and labels – Requirements on hot alkali penetration and resistance
ISO/IEC 15416	Information Technology – Automatic identification and data capture techniques – Bar code print quality test specification – Linear symbols
ISO 2859-1	Sampling procedures for inspection by attributes – Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection
MEBAK Band 5	Gebinde und Produktausstattungsmittel, 3. Auflage 2009
EN ISO 534	Paper and board – Determination of thickness, density and specific volume
DIN 53107	Prüfung von Papier und Pappe – Bestimmung der Glätte nach Bekk
DIN 53108	Prüfung von Papier und Pappe – Bestimmung der Rauheit nach Bendtsen
ISO 187	Paper, board and pulps – Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples

IV Transfer of particles into the bottle washing machine

The printing of labels for reusable bottles should be carried out in accordance with the state of the art in such a way that it causes as little particle transfer into the bottle washing machine as possible. Manufacturers and customers shall work together to reduce the transfer of particles into the re-use cycle by informing each other of relevant findings and, within the scope of their capabilities, supporting each other in identifying the causes of potential transfers and developing solution strategies.

Tolerance catalogue

for assessing the abrasion resistance of beverage bottle labels

March 2026

VERSUCHS- UND LEHRANSTALT FÜR BRAUEREI IN BERLIN (VLB)
- Testing Laboratory for Packaging -

Publisher:

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Introduction

This tolerance catalogue can be used to evaluate the abrasion resistance of beverage bottle labels made of paper or metallised paper.

The catalogue contains samples of dry and wet scrubbed samples of printed label paper and printed metallised label paper.

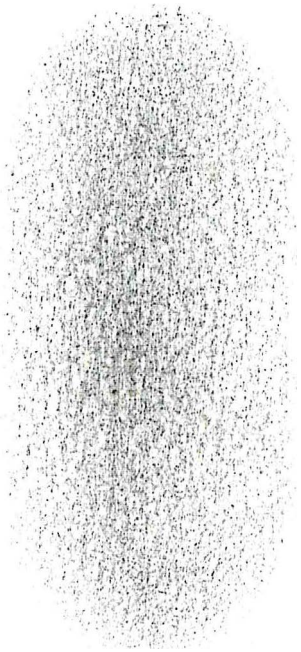
After visual assessment of the scrubbed label samples and the abrasion on the scrubbing paper, an evaluation is made according to the following scheme: good, normal or low abrasion resistance.

Explanations are provided for each grading level.

This tolerance catalogue has been agreed with representatives of the parties involved (label printers, printing ink manufacturers, users).

Abrasion resistance, dry

(Paper labels)

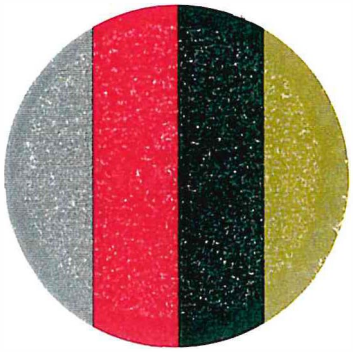
good	standard	poor
		
		

Explanations

- no visible abrasion of printing ink on the label	- visible abrasion of printing ink on the label	- clearly visible abrasion of printing ink on the label
- barely visible abrasion of printing ink on the rub strip	- visible abrasion of printing ink on the rub strip	- clearly visible abrasion of printing ink on the rub strip

Abrasion resistance, wet

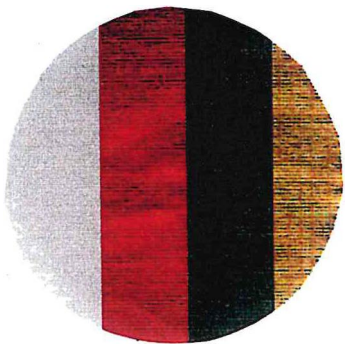
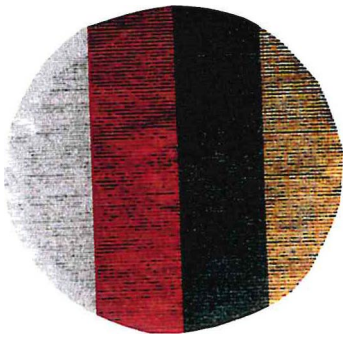
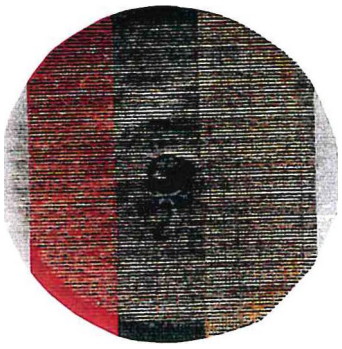
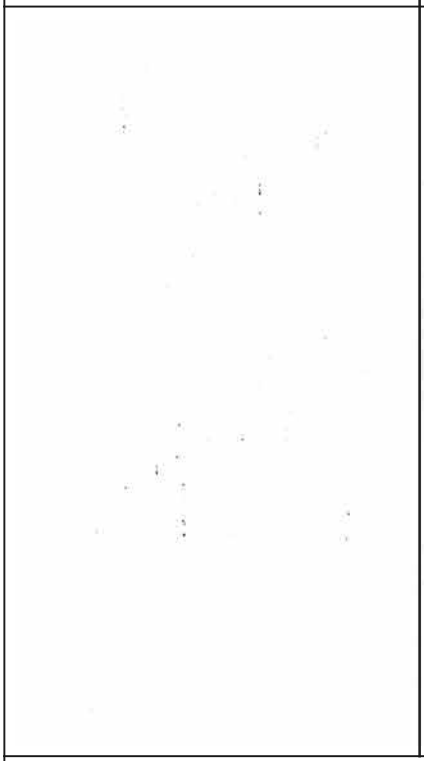
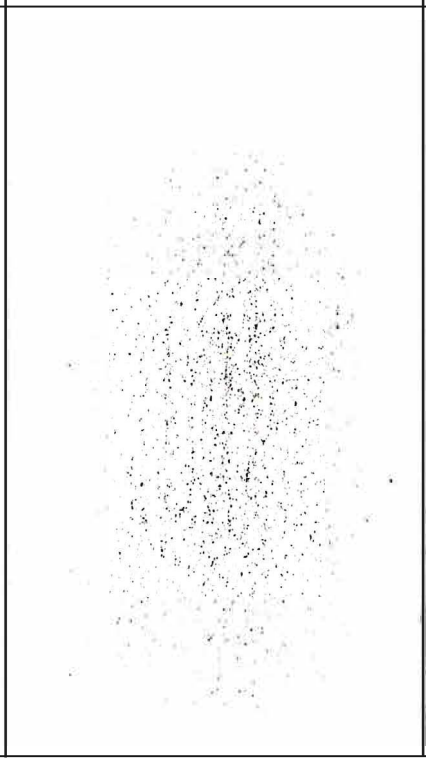
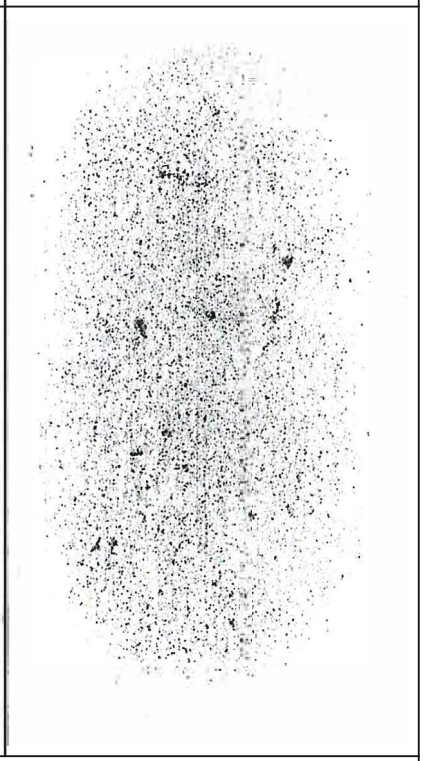
(Paper labels)

good	standard	poor
		
		

Explanations

- no visible abrasion of printing ink on the label	- visible abrasion of printing ink on the label	- clearly visible abrasion of printing ink on the label
- barely visible abrasion of printing ink on the rub strip	- visible abrasion of printing ink on the rub strip	- clearly visible abrasion of printing ink on the rub strip

Abrasion resistance, dry
(Metallised paper labels)

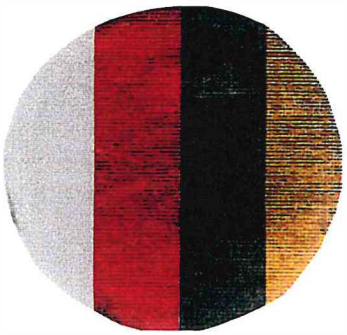
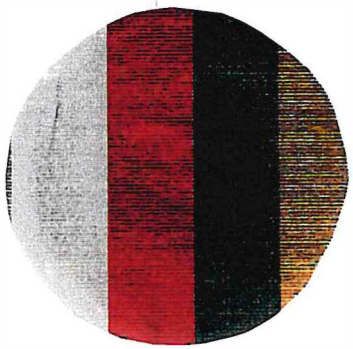
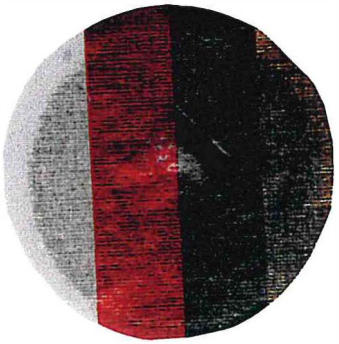
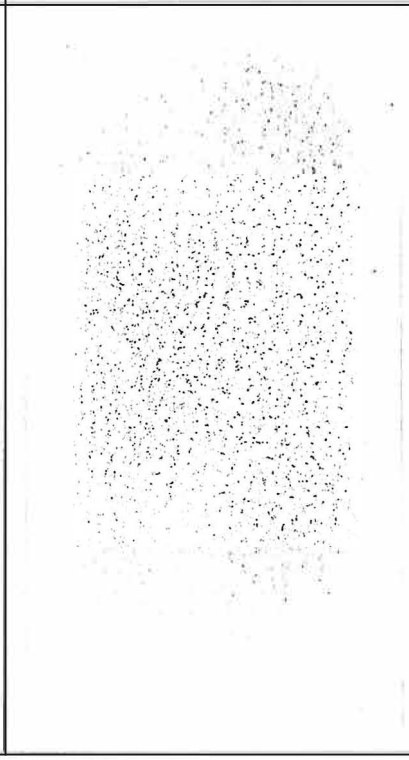
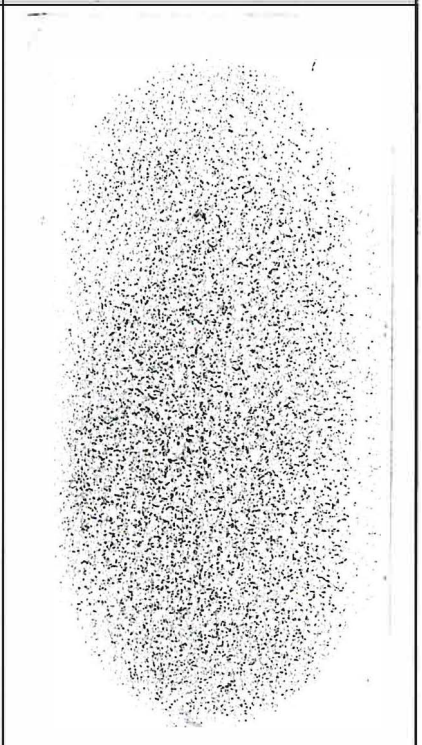
good	standard	poor
		
		

Explanations

- no visible abrasion of printing ink on the label	- visible abrasion of printing ink on the label	- clearly visible abrasion of printing ink on the label
- barely visible abrasion of printing ink on the rub strip	- visible abrasion of printing ink on the rub strip	- clearly visible abrasion of printing ink on the rub strip

Abrasion resistance, wet

(Metallised paper labels)

good	standard	poor
		
		

Explanations

- no visible abrasion of printing ink on the label	- visible abrasion of printing ink on the label	- clearly visible abrasion of printing ink on the label
- barely visible abrasion of printing ink on the rub strip	- visible abrasion of printing ink on the rub strip	- clearly visible abrasion of printing ink on the rub strip