

UPDATE JULY 2025

GUIDELINES

Reel Identification and Finishing



CONTAINERBOARD
EUROPE



Corrugated Packaging



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1 Introduction

The first draft of this document **Reel Identification and Finishing** was published as part of the Corrugator Efficiency Working Group established in early 2000. This third issue of the document is a revision to take into account the changes in the corrugating industry over the last years.

This document is the result of collaboration between containerboard and corrugated board manufactures. It takes into account the ever-increasing requirement to reduce waste in time and paper by revising the manner reels are identified, built, finished and labelled.

This new issue of the guidelines presents several changes and additions on the following points:

- The marking of paper joins on reel ends
- A requirement that reel cores should be capable of repeat mounting without damage
- Guidelines for the positioning of paper maker joins and reel tension
- Transit damage limitations and rectification procedure
- Handling of reels

This third version is not an end in itself since the intention of Fefco and Containerboard Europe is to continue working jointly on this document in order to integrate the best practices of reels management that could emerge and, thus, contribute to improve the efficiency of corrugated board manufacturing plants.

2 Labelling of reels

2.1 Reel identification

Identification of the reel is the main function of the label.

Each mill has a unique number for each reel to allow retrieval of all the product data at any time. For clear identification of the reels, it is vital to have and utilize a uniform bar code system, which provides consistency between the coding and the information.

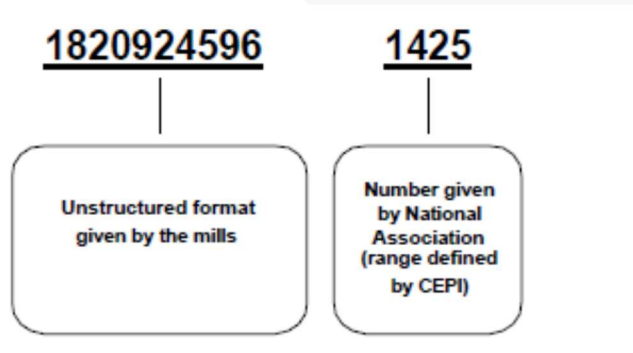
The reel number should always be available as barcode and text format.

Unit Identifier Bar code

There is a current version of the Unit Identifier bar code normally used within Europe is a 14 digit length numeric code. This type of code can be scanned and recognized by modern bar code readers. Its implementation is recommended in order to allow standardization within the industry. The utilization of the 14 digits version assists all users who are wishing to read bar codes at long distances using automatic reading equipment.

Structure of the 14-digit numeric Bar code

- 10-digit reel number assigned by the mill.
- 4-digit mill number assigned by the National Associations (Some countries with limited resources rely on CEPI).



The symbology of the 14-digit bar code must be Code **128C** to European Standard EN 799.

The label must include the reel number in a text form and at least 1 unit identifier standard bar code printed horizontally or optional vertically.



To facilitate the handling of the reels, it is considered as useful if the bar code is available in peel-off mode.

For the control of the quality grade of a printed bar code it is recommended to refer to the Cen/Ansi test standard EN 1635.

2.2 Paper & Reel information

For an optimal management of the paper reels in the paper mill as well by the customer, the list of items presented below provides recommendations (no obligation) for the information to be printed on the label or directly on the reel.

Paper information

- Paper type
 - o Beside the paper mill trade name, the international paper grade name, where available, as stated in the Containerboard Europe "European list of corrugated base papers"
 - o Printed on reel label
 - o Printed directly on reel end
- Grammage
 - o Printed on reel label
 - o Printed directly on reel end

Reel information

- Width
 - o Printed on reel label
 - o Printed directly on reel end
- Reel diameter
 - o Optional: 1 printed on reel label
- Internal core diameter
 - o Optional: printed on reel label only when different than the standard agreed of 100 mm
- Outer core diameter
 - o Optional: 1 printed on reel label

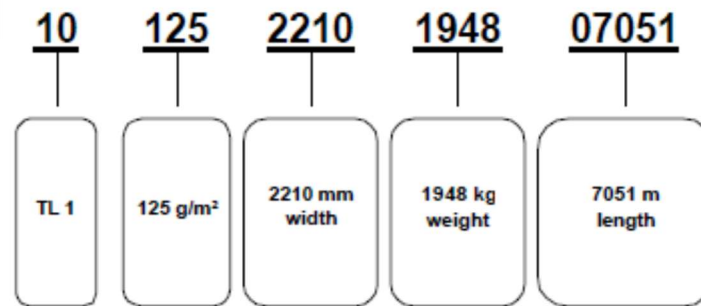
- Topside indication
 - o Optional: 1 printed on reel label
- Unwind direction
 - o 1 printed directly on reel end
 - o Optional: 1 printed on reel label
- Reel weight
 - o Printed on reel label
- Reel length (measured or calculated over reel weight)
 - o Optional: 1 printed on reel label
- Reference to production period (preferably production date)
 - o Printed on reel label
- Moisture content
 - o Only on specific agreement between producer and user
 - o When agreed, this value should identify the average moisture content of the reel
 - o Optional: 1 printed on reel label

2.3 Combined Paper & Reel information

The Unit Identifier is not designed for describing products. There is a specific requirement for extra product information, and this is met by an additional 18 digit bar code as specified in the Containerboard Europe standard.

Structure of the 18-digit numeric bar code

- Digit 1-2: paper type (Containerboard Europe code)
- Digit 3-5: grammage
- Digit 6-9: reel width
- Digit 10-13: reel weight
- Digit 14-18: reel length



In this particular example:

A reel of Testliner 1, 125 g/m², 2210 mm width, 1948 kg weight and 7051 m of paper length.

The symbology of the 18-digit bar code must be Code **128C** to European Standard EN 799.

It is recommended that the label includes the paper & reel information in text form and at least 1 Containerboard Europe standard bar code printed horizontally or, optional, vertically.

To facilitate the handling of the reels it may be useful if the bar code is available in peel-off mode.

For the control of the quality grade of a printed bar code it is recommended to refer to the Cen/Ansi test standard EN 1635.

2.4 Customer specific information

In principle, each label should contain the basic information to identify a reel and provide the user with all the necessary information to handle the paper reels.

Addition of specific information should be limited to precise requirements from users/customers or general information that can provide an added value during transport (e.g. port of destination for export orders).

If there are more codes used than the recommended bar codes, they should not prevent proper reading at the customer.

2.5 Summary of label information

It is recommended that each reel should be delivered with, ideally, at least 1 reel label containing the information as listed below. Listing all information has preference but is obviously not compulsory:

- Grade name
- Substance [g/m²]
- Reel width [mm]
- Reel weight [kg]
- Paper length [m]
- Production date [dd-mm-yyyy] or [yyyy-mm-dd]
- Unwinding direction
- Reel ID (reel number), including 4-digit CEPI mill code
- Bar codes for reel ID and paper data (corresponding to Containerboard Europe requirements)
- Bar code standard type 128C according European Standard EN 799

The following additional information could also be added, as this would assist the operator when handling and processing the reels:

- Customer name and other specific information on reel label, if needed
- Internal core diameter (only when different from the normal 100 mm)
- Outer core diameter
- Reel diameter
- Topside indication
- Moisture content, if requested
- Extra CEPI unit identifier bar codes (128C)
- Extra Containerboard Europe standard bar codes (128C)

To facilitate the handling of the reels it is recommended and maybe useful if extra bar codes in peel-off mode are available.

2.6 Positioning of the label and other reel marking

Positioning of the label

It is recommended that each reel should be delivered with at least 1 reel label containing as a minimum the information as stated in the § 2.5 "Summary of label information".

The label should be positioned on the reel belly.

Preferably the label should be positioned on the top part of the reel, so that it is readable when the reel is standing.

Other reel marking

For enhanced identification of the reels it is recommended to print some information directly on reel end. This will be beneficial for reels not completely utilized, stored in the warehouse waiting for the next utilization.

This extra marking on reel end should be limited to following information:

- Reel number
- Paper type
- Grammage
- Width
- Unwind direction
- Joint position, as a minimum on one reel end

2.7 Recommended font and size

Paper label

The following directions are provided in relation to a label size of 297 x 420 mm (A3 format). The recommended font and size aim to provide good readability and clearness of the label.

The font recommended is Arial Narrow.

- Reel number = Arial Narrow 124
- Paper type = Arial Narrow 124
- Grammage = Arial Narrow 124
- Width = Arial Narrow 124
- Reel weight = Arial Narrow 100
- Reel length = Arial Narrow 100
- Production period = Arial Narrow 40
- 1 CEPI unit identifier bar code (128C) printed
 - o vertically approx. 100 x 20/25 mm (including numbers)
 - o horizontally approx. 100 x 20/25 mm (including numbers)
- 1 Containerboard Europe standard bar code (128C) printed
 - o vertically approx. 125 x 20/25 mm (including numbers)
 - o horizontally approx. 125 x 20/25 mm (including numbers)



For the additional information:

- Internal core diameter = Arial Narrow 20
- Outer core diameter = Arial Narrow 20
- Reel diameter = Arial Narrow 20
- Moisture content = Arial Narrow 56
- Extra Cepi unit identifier bar codes (128C)
 - o vertically approx. 50 x 10/15 mm (including numbers)
 - o horizontally approx. 50 x 10/15 mm (including numbers)
- Extra Containerboard Europe standard bar codes (128C)
 - o vertically approx. 50 x 10/15 mm (including numbers)
 - o horizontally approx. 50 x 10/15 mm (including numbers)

Deviations from the above recommendations are allowed as far as the readability and the clearness of the label is not compromised. In case the label has a size different than A3 standard, the proportion of the fonts should be respected as well.

Direct printing on reel end (optional)

The direct printing on reel end can be replaced by a label placed on the reel end itself.

The direct printing solution is preferred in order to avoid glue from the label sticking between paper layers of the reel.

This extra label should contain the same information as the direct printing on reel end:

- Reel number
- Paper type
- Grammage
- Width
- Unwind direction
- Joint position, as a minimum on one reel end.

2.8 Label layout example

Providing the clear readability and the completeness of the content of the label remain the responsibility of the producer. In case where the label needs to be renewed and, in general, to provide some help for the future development, here an ideal layout is proposed:

Supplier	16 Trade name		1 TESTLINER 2	
	2 Substance (g/m²) 100	3 Width (mm) 2210	4 Mill	6 Diameters & Topside 112 1250
	7 Weight (kg) 2260	8 Length (m) 10249	5 Unwind Direction →	10 Reel & Paper Data
	9 Production Date / Period 20140213		11 Reel Number	
	12 Reel number		13 Reel number 20149821881840	
	14 Handling Information		15 Other Information	
	13 Reel number			

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Trade name & international paper grade name 2. Basis weight (nominal) 3. Reel width 4. Mill name 5. Unwind direction 6. Outer core diameter + reel diameter + topside indicator 7. Reel weight 8. Paper web length 9. Production date | <ol style="list-style-type: none"> 10. Barcode 18 digits (eventually Peel-off) 11. Barcode 14 digits (eventually Peel-off) 12. Big version of the horizontal barcodes (eventually to be printed also vertically) 13. Reel number 14. Special handling information 15. Other information (fe customer name) 16. Name of the supplier; ^{SEP} could be placed either horizontally ^{SEP} on the top part or vertically on the left side |
|--|--|

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3 Core requirements

3.1 Quality and strength

There are number of factors, which can result in crushed cores and reaming out, such as reel winding tension, excessive clamp truck pressures or the influence of corrugator (reel stand or chucks). As a consequence, the cores used in the reels should be of adequate quality to be suitable for several remounting of the reel on the corrugator.

The core should be one piece. Split cores are not accepted.

3.2 Dimensions and positioning

Cores should have an inner diameter of 100 millimeters with a tolerance $+3/-0$ mm.

The outer diameter should be 120 mm with a tolerance of $+0/-8$ mm, unless otherwise agreed between the supplier and customer.

It is recommended to have the outer diameter of the core printed on the reel label to allow proper setting of the splicing operation.

For core alignment, there can be a tolerance of $+2/-3$ mm on each side. However, the intention remains to work for the reduction of misalignment (for instance to reach a tolerance of $+0/-1$ mm).

4 Reel finishing, storage, traceability

4.1 Reel width and diameter

The reel width tolerance is ± 3 mm. The typical reel diameter is max 1450mm, unless something else has been agreed between the supplier and the customer.

4.2 Joins and winding

No joins should be closer than 100 mm from the core or the beginning of the reel. Ideally splice position to be included on reel label. Join position shall

be marked as a minimum on one reel end and preferably on both reel ends. The number of joins should be max 2.

Paper should be attached to core by tape or glue, preferably not tacked. The first 20 meters of the paper at the core are also considered as packaging.

Winding should be tight and, even, Schmidt hardness should not vary by more than 10 across the reel width.

As for the reel body and reel end, the outer layers should be fixed with glue and/or tape, plain flat reel end surface and no telescoping.

4.3 Damage definition and tolerances

Reels should be delivered clean, free from dirt and contamination, particularly to respect food packaging applications, and with no edge or belly damage beyond the transit packaging specified below.

The top 5 laps shall be considered as transit packaging. Damage to the reel belly less than A4 size must be taped before the reels are dispatched to the customer to prevent further damage. When the damage is greater than A4 or deeper than transit packaging, the reel should be reworked prior to transit and re-labelled with new weight.

To support corrective action, damage deeper than 5 laps must be recorded and confirmed by both the receiving person and the carrier representative on transport documents (e.g. CMR document). In addition, damage must be clearly documented, preferably in the form of photographs. The documentation must clearly show the damage at the reels and, if visible before unloading, the position of the damaged reels on the carriage before unloading have been commenced. If collection of damaged reels is required, then they should be stored in a specific area to avoid further deterioration and the documentary evidence should be sent to the supplier. Reels returned to the supplier, if intended for re-delivery, must be reworked to remove the damage and re-labelled with the new dimensions.

4.4 Handling of reels

Along its logistical way – including in the converting plant from unloading to delivery to the corrugator – a paper reel undergoes a number of manipulations by means of lift trucks, which increases the risk of damages.



To prevent these, it is therefore necessary to ensure that all of the following factors affecting how clamps grip a roll are well managed:

- The hydraulic pressure delivered by the lift truck to the clamps and its consistency over time
- The position according the "centerline" of the reel and the force applied by clamps on the reel according its diameter
- The design of the contact pad surface and the management of the friction between the clamp and the paper
- The management of dynamic forces resulting from movement of the forklift on sometimes uneven floors
- The respect of a minimum "Clamp force factor", which express the relation between clamping force and load weight. For instance, this factor must be in a range of 1,5 to 2,3 for the manipulation of a containerboard reel.

4.5 Storage and best before

Reels should be stored in a clean and dry storage, with a stable atmosphere and minimum humidity variation. Variation in relative humidity can cause creases, warp at splice or cracking at conversion.

Paper in storage after delivery, longer than 1 year should be considered outside manufacturers specification warranty.

4.6 Traceability

To improve the traceability of the product origin, it is highly recommended to keep the reel label until the end of the utilization-life of each single reel.