



RETURPACK

**Technical Specification and
Marking Manual**

Metal and Plastic Packaging



**2018-02-05
Returpack AB**

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Revision History

| Version/Date | Change |
|--------------|--|
| 2012-01-01 | Document created |
| 2016-05-01 | New template and structure, new chapter 7.1, change in 12.2 |
| 2016-05-04 | Clarifying the definition of heavy metals in section 12.3 |
| 2018-02-05 | Revision in chapter 3 regarding allowed dimensions, revision of chapter 12 regarding material requirements for plastic containers. |

1 Introduction

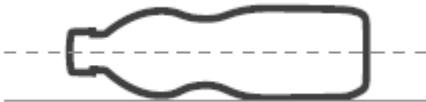
This document aims to describe the requirements a packaging has to fulfil to be part of Returpack's Return system. The requirements ensures the function throughout the recycling process, from collection to the manufacturing of a new bottle or can.

Returpack reserves the right to amend the requirements in this specification in accordance with chapter 4.1 of the Agreement terms and condition (Appendix 1).

2 Shape

The preferable bottle shape is cylindrical and symmetrical. Furthermore, a long bottle neck may cause the bottle to wobble in the course of rotation during barcode reading. A packaging with long neck or irregular shape will need further assessment by Returpack and cannot be assured to be accepted.

Practical test: Place the bottle with the cap fastened on a flat surface. If the upper part of the bottle hits the surface, or if the bottle balances on its shoulder, there is a risk that the bottle cannot be accepted. Contact Returpack for assessment.



3 Dimensions

The following dimensions of packages are allowed:

| | Min | Max |
|-----------------|-------|--------------------|
| Diameter | 50 mm | 120 mm |
| Height | 85 mm | 360 mm (incl. cap) |

4 Material Thickness

The hardness of the bottle is an important parameter in the approval of new products. This is particularly relevant for bottles that are much thicker and/or have harder bottom structure compared to their conventional counterparts. Hard bottles can cause problems in the RVM when compressed. There is a risk that parts get stuck in the compactor, causing blockage and machine failure.

Material thickness is measured by compression tests. The force required to compress the packaging to a maximum of 15 mm is measured. The force is not allowed to exceed 2 kN.

5 Barcode Marking

The packaging must be marked with a barcode according to EAN-13, EAN-8, and UPC-A or UPC-E standard (ISO/IEC 15420).

The standard requires that the barcode has a quality of "Grade C" ANSI (equivalent to "Grade 2" ISO / IEC 15416) during the entire lifetime of the packaging.

For general specification of the format and colouring of barcodes, refer to www.gs1.se.

6 Barcode Format

The barcode shall have the following format:

| Factor | EAN-13 | EAN-8 | UPC-A | UPC-E |
|--------|---------------------|---------------------|---------------------|---------------------|
| | Width x height (mm) | Width x height (mm) | Width x height (mm) | Width x height (mm) |
| 0.8 | 29,8 x 20,7 | 21,4 x 17,0 | 29,8 x 20,7 | 21,4 x 17,0 |
| 1.0 | 37,3 x 25,9 | 26,7 x 21,3 | 37,3 x 25,9 | 26,7 x 21,3 |

Returpack recommends the use of factor 1.0. Minimum factor 0.8 is required.



6.1 Quiet Zone

To the left and right of the barcode there shall always be a light margin or quiet zone. A quiet zone is an empty area required for the adjacent information, such as package decoration, not to interfere with the reading.



6.2 Barcode Position Metal Packaging

The barcode must be printed vertically, i.e. like a ladder up the side of the can. The lowest bar of the barcode must be situated from 8 to 35 mm from the lower rim of the decoration. If there is no decoration, the distance of 15 - 35 mm from the lower edge of the can is applicable.

6.3 Barcode Position Plastic Packaging

The barcode shall be placed vertically, i.e. like a ladder up the side of the bottle, at least 35 mm from the bottom of the bottle and at least 60 mm from the top of the bottle.

The barcode should be placed/printed on the flattest surface possible on the packaging to improve barcode reading and avoid deformation of the barcode.

6.4 Barcode Colours

The barcode readability is based on the contrast between the dark bars and a light background. Black lines on a white background give the highest contrast, other colour combinations can work but avoid a transparent background. It is important to carry out performance checks in each case.

For more information about possible colour combinations, refer to <http://www.gs1.se/en/>.

7 The Importance of an Unique Barcode

The producers and importers are responsible for all the packagings marked with their registered barcode, which also means that the producer/importer undertakes the responsibility to pay the deposit and fees for all packagings marked with their barcode. Therefore, it is important that the barcode reported to Returpack is unique for the producer/importer and for the deposit system.

A product that has been sold without deposit in Sweden has to change to a new barcode when entering the deposit system.

The producer/importer is responsible for obtaining the barcodes from GS1 Sweden,

7.1 Exports

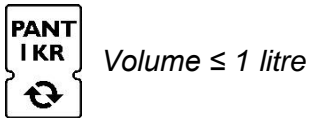
Products intended for duty-free and export, that is only going to be sold outside Sweden, shall not use a barcode or deposit mark connected to Returpack's deposit system.

All products sold with a Swedish deposit mark shall be reported to Returpack (and settled deposit and applicable fees for) even if they are sold outside of Sweden.



8 Deposit Mark

A deposit mark, depicted below, must be printed in the close vicinity of the barcode. The smallest acceptable size for the deposit mark is 10 x 15 mm. Black text on white background is recommended. Also other combinations may be permitted after approval by Returpack. Only the original format may be used.



9 Adhesive Labels

If it is not possible to design the original label of the packaging in order to comply with the Returpack marking requirements, the requirements must be fulfilled by using adhesive labels. The labels can only be ordered from Returpack. **It is not allowed to use self-made labels to cover the original label.**

10 Registration

Packaging samples along with registration form and necessary material specifications must be sent to Returpack for approval at least six weeks before a new product is planned to be made available on the market.

The packaging will be controlled to meet the requirements of this specification. Practical tests are made for measuring the quality of the barcode, dimensions and shape. Reverse vending machines and certified equipment for barcode reading are used. Material thickness is tested by compression tests. If needed, supplementary tests can be ordered from the RVM manufactures or plastic recyclers in consultation with the producer/importer.

After having approved the product, Returpack will register its barcode in the article register. The RVMs in the retail stores are updated on a weekly basis.

Fill in registration form at <https://pant.returpack.se> and send samples to:

Returpack AB
Att: Produktregistrering
Hanholmsvägen 67
602 38 Norrköping
Sweden

10.1 Change of shape, size, label or material

All planned changes to already registered products must first be approved by Returpack before launch can take place. New packaging samples and specifications must be sent to Returpack for approval.



11 Material Specification for Metal Packagings

For metal packagings only aluminium or steel are allowed.

Packagings combining aluminium/steel and plastic materials are not allowed, except from plastic sleeves or labels. Very small plastic parts can be allowed on special conditions after assessment by Returpack. The use of PVC is not allowed.

Metal packagings with a design or material that makes them harder still has to fulfil the requirements in chapter 4 to be approved. It can be cans of three parts made of thicker material or metal bottles of thicker material.

Cans containing a small gas compartment, or a so-called "widget" containing N₂, CO₂ or a mixture of gases may be accepted, but Returpack must be consulted first in each case, as some gas containers may harm the compression machinery in the RVMs.



12 Material Specification for Plastic Packagings

Plastic packagings are divided into four fractions; colourless PET, coloured PET, HDPE and PP. The plastic materials are sorted using different techniques, for example NIR spectroscopy and swim-sink separation by density. The packaging design is very important for the sorting to succeed and for the production of a high quality recycled material.

- All included materials shall be approved for use. If the product consists of materials that are not allowed, the product cannot be connected to the return system.
- If the product consists of materials that are not specified in the list, Returpack shall be contacted for assessment and eventual approval.

Specifications on all materials used shall always be submitted when notifying new products and/or making changes to products that are already registered to the deposit system.

The table below shows permitted materials for each fraction and materials not permitted for any fraction:

| Fraction: | Colourless PET | Coloured PET | HDPE | PP | Not permitted |
|---------------------------|-------------------------------------|--|------------------------------|-------------------------------|--|
| Bottle | PET | PET | HDPE, PE | PP | PLA, PVC, PS, PET-G, PEN, PEF |
| Colour | Transparent, transparent light blue | All colours besides transparent and light blue | All colours | All colours | Metallic colours, addition of minerals, in PET Titanium dioxide (TiO ₂) and carbon black is not approved |
| Barrier | Not permitted | Permitted | Not permitted | Permitted in coloured bottles | EVOH, PVDC, PEN |
| Label | Paper, PP, PE, TPE | Paper, PP, PE, TPE, PET | Paper, PP, PE, TPE, PET | Paper, PP, PE, TPE | PVC, metal folio, OPS |
| Sleeve¹ | ² PET, PP, PE | PET, PP, PE | PE, PET, PP | PET, PP | PVC, metal folio, OPS |
| Printing Ink | Follow EuPIA's guidelines | Follow EuPIA's guidelines | Follow EuPIA's guidelines | Follow EuPIA's guidelines | Water-soluble inks, substances on EuPIA's exclusion list |
| Glue | Water/Alkali soluble in 65°C | Water/Alkali soluble in 65°C | Water/Alkali soluble in 65°C | Water/Alkali soluble in 65°C | |
| Cap | PE, PP, crown cap | PE, PP, PET, crown cap | PE, PP, PET, crown cap | PE, PP, crown cap | Other metal caps |
| Liner | PE, EVA, TPE | PE, EVA, TPE | PE, EVA, TPE | PE, EVA, TPE | PVC, silicone, metal |

¹ Label that covers at least 75% of the bottle surface

² Additional sorting fee



12.1 Bottle material and colour

Additives that change the plastics physical density interfere with the swim-sink separation, and are therefore not allowed. For bottles made of HDPE or PP are minerals and other substances that increase the density to over 1 g/cm³ not permitted.

In PET and PP bottles, the addition of dyes containing carbon black or titanium dioxide is prohibited. These pigments discolour the recycled material and prevents the recycled material to be used to produce new packagings. However, for HDPE bottles these are allowed.

12.2 Barrier, Coatings and Additives

For colourless bottles of PET, HDPE and PP the use of barriers, coatings and additives is prohibited. There are some exceptions for a few blockers and additives which have been tested and approved by Returpack. Contact Returpack for more information.

For coloured bottles, the use of barriers is allowed to a greater extend. If a bottle contains a barrier, coating or additive it has to be stated in the material specification for the packaging.

12.3 Label

A sleeve shall cover at least 75% of the bottle's surface.

A label should cover up to approx. 40% of the bottle's surface to be sorted effective.

The requirement on coverage of a sleeve is to ensure that a clear plastic bottle with a barrier or PET-sleeve will be sorted as coloured and not contaminate the clear PET-fraction. If a sleeve is used on a colourless bottle it will be sorted as a coloured bottle and a sorting fee will be added.

The easiest way to calculate the proportion of the bottle's surface covered by the label is to divide the label height with bottle height, where bottle height is measured 15 mm from the base of the bottle and over the shoulder.

12.4 Printing Ink

Printing ink on the labels shall not be water-soluble and shall fulfil the guidelines stated by the *The European Printing Ink Association (EuPIA)*, the guidelines document is titled *EuPIA Guideline on Printing Inks applied to the non-food contact surface of food packaging materials and articles* and can be found at <http://www.eupia.org/>.

12.5 Glue and adhesives

Glue used at labels shall be soluble in 65°C hot water mixed with an alkaline solution.

Hotmelt or other types of glue may function in the recycling process but has to be tested. Contact Returpack for more information about tests and approved glues and adhesives.

12.5.1 Transition period for adjustment to the new requirement

The requirement of water soluble glue at 65°C is a sharpening of the previous requirement water soluble at 70°C. In order to facilitate the adjustment will all glues and adhesives approved before





2017-12-31 be allowed for use until 2020-02-01. Thereafter shall all glues and adhesives be water soluble in 65°C.

12.6 Cap and Liner

Caps of metal are not allowed for plastic packagings, except for crown caps. Caps of PET are not allowed for clear, colourless PET or PP bottles.

A liner is a seal on the inside of the cap that is sometimes used to improve the sealing.





13 Abbreviations

| | |
|-------|-----------------------------------|
| EuPIA | European Printing Ink Association |
| EVA | Ethylene vinyl acetate |
| EVOH | Ethylene vinyl alcohol |
| HDPE | High Density Polyethylene |
| NIR | Near Infrared |
| OPP | Oriented Polypropylene |
| OPS | Oriented Polystyrene |
| PA | Polyamide, Nylon |
| PE | Polyethylene |
| PEF | Polyethylene Furanoate |
| PEN | Polyethylene Naphthalate |
| PET | Polyethylene Terephthalate |
| PET-G | Polyethylene Terephthalate Glycol |
| PP | Polypropylene |
| PS | Polystyrene |
| PVC | Polyvinyl Chloride |
| PVDC | Polyvinylidene Chloride |
| RVM | Reverse Vending Machine |
| TPE | Thermoplastic elastomers |

