

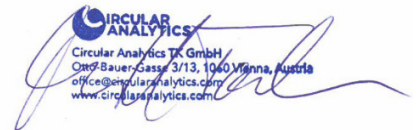
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# ECMA

## ENVIRONMENTAL COMPLIANCE OF CARTON PACKAGING

General Information	
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## INTRODUCTION

Carton boxes made of solid board or paperboard play an important role in Europe's economy. They provide ideal protection for a large variety of products. Moreover, their supreme printability makes them ideally suitable for consumer packaging. Attractively printed paper packaging enhances brand favourability and consequently leads to purchases. Moreover, they are made of renewable materials and they are recyclable. Therefore, carton boxes are the packaging of choice for brand owners and producers of consumer goods. Applications for carton box packaging include frozen food, cereals, sweets, fruits, tobacco, spirits, personal care products, pharmaceuticals, trays, shelf-ready packaging, powder detergents, and many more. Carton boxes will continue to see good market opportunities due to ambitious plastic reduction targets set by many leading retailers and brand owners.

Folding cartons are used to package a great variety of food and non-food products, eg. cereals, frozen food, fresh produce, etc. Rigid boxes are suitable for luxury products, expensive watches or iPhones. Composite cans consist of a paperboard body, opening systems and a bottom end closure. Typical applications of composite cans include packaging of powdered products, snacks, cereals, pet products, dried fruit, nutraceuticals and many more.

This study presents the relevant environmental legislation of cartons in Europe. It outlines the different aspects of environmental compliance, including Packaging and Packaging Waste Directive, Extended Producer Responsibility, recyclability, and the use of recycled fibres. A list of European countries covered by the present study can be found in the ANNEX A table 1. The situation in markets outside Europe does not fall within the scope of this report. The report deals with cartons, however, it does not address beverage cartons.

## MATERIALS

This chapter gives a brief overview of the different materials needed for the production of the described solutions. It covers the sourcing and processing of these materials as well as the reasons for their use.

### FIBERS

Fibres for papermaking are primarily sourced from hardwood, softwood or waste paper. Important additives are starch, titanium dioxide, calcium carbonate and others. The wet strength of paper can be increased by adding different chemicals like epichlorohydrin or urea formaldehyde, which polymerize the paper. While fibres and starch are fully renewable, this is not true for mineral additives. However, there are abundant reserves of titanium and calcium carbonate.

### GLUES

Hot melt adhesive is a form of thermoplastic adhesive. The glue is tacky when hot, and solidifies in a few seconds. They are mainly applied for box sealing, carton closing and labelling. Important hot melt glues are Ethylene-Vinyl-Acetate and Polyurethane. Other glues are Polyvinyl acetate and acrylic adhesives. All the mentioned glues are based on non-renewable fossil fuels.

### PLASTICS FOR COATINGS AND LAMINATION

Moisture negatively affects the mechanical properties of paper. Therefore, paper used to package food is often coated or laminated with plastic. The plastic is used to improve functions such as water resistance, tear strength, abrasion resistance, and the ability to be heat sealed.

The most important plastics for coating are low-density polyethylene (LD-PE) and to a lesser extent PET. Recently, paper cups coated with polylactic acid (PLA) have been introduced. LD-PE and PET are mainly petroleum-based plastics, although it is possible to produce biobased PE as well. These polymers are not compostable. PLA is biobased and compostable in industrial composting plants.

There are two possible ways to apply a polymer layer on paper: lamination and coating. Lamination means that a plastic film is applied onto the paperboard surface, often with the help of adhesives. In the case of coating, the hot polymer is directly extruded onto the paper surface.

### PLASTIC COMPONENTS

Cardboard packaging, especially composite cans, often contains additional plastic parts like caps, lids, handles, and spoons. Cardboard boxes with windows become increasingly popular. Windows are usually made of plastic films or sheets, which are glued to the cardboard. Typical materials for the windows are PET, PVC, PLA, PP and others.

## METAL COMPONENTS

Composite cans often include bottom closures made of tin plate steel. Aluminium foil is sometimes used for peel-off lids or as an additional barrier layer.

## RECYCLING OF PAPERBOARD PRODUCTS

Paper products are – in principle – easy to recycle. Fibres can be recycled multiple times. The recycling process leads to a deterioration of fibre quality (eg. reduced tensile strength). Recycled fibres may be contaminated by mineral oil residues.

There are some issue regarding the recycling of cartons due to the fact, that they are often composed of different materials. Plastic components can be removed during the recycling process, and the fibres can be retrieved, however, the removal and disposal adds costs. Plastic is a contaminant and will be rejected. The Confederation of Paper Industries (CPI) published “Paper and Board Packaging Recyclability Guidelines”. This document explicitly states that “paper mills would prefer not to receive plastic or metallised laminated board”. Especially troublesome are plastics, which easily break down into microplastic or PVC, because it may release toxins. Plastics should be designed out altogether, or reduced to an absolute minimum. If this is not possible, it should be designed to be easily separated by the process so it can be rejected at the beginning of the papermaking process (CPI, 2020). In a joint statement, the OPRL LTD (The On-Pack Recycling Label) and the CPI define a 15 percent ceiling as the threshold for single sided coated paper packaging to be considered recyclable but at lost value. A more stringent 10 percent ceiling will apply as the threshold for assessment as recyclable at full value (OPRL LTD & CPI, 2020).

Another challenge for paper recycling are glues. During the pulping process, they may form so-called Stickies, spoiling the performance and appearance of the recycled paper. Macrostickies (> 2000 µm) can be easily removed by screens, but microstickies (< 2000 µm) pass through these screens and can cause serious problems. Consequently, the choice of adhesives for box making significantly influences the recyclability of cardboard packaging (European Paper Recycling Council, 2018).

Metal components can be removed, but this adds costs and decreases the efficiency of the recycling process.

Additives like titanium dioxide, calcium carbonate or starch do not cause any problems in the recycling process.

Wet strength paper potentially impairs the recyclability of paper. The addition of permanent wet strength resins interferes with the repulpability of paper. Wet strength paper generally cannot be defibered and repulped in neutral water without extraordinary means, including higher water temperatures, longer pulping times, and the use of oxidizers. There are different wet strength resins, and paper recycling mills can vary on type of pulping and screening equipment, among other things. Therefore, generalized statements about the recyclability of wet strength paper must be taken with caution.

## REGULATORY FRAMEWORK – ENVIRONMENTAL COMPLIANCE

This chapter discusses environmental compliance of carton packaging in Europe. The situation outside Europe is not within the scope of this report.

### DIRECTIVE 94/62/EC ON PACKAGING AND PACKAGING WASTE

The European Parliament and Council amended this directive in 2018. The most important changes refer to ambitious recycling rates (Article 6), calculation rules for recycling rates (Article 6a), Extended Producer Responsibility (EPR) schemes (Article 7), and design requirements for packaging (Annex II).

The member states must recycle 75% of paper and cardboard by 2025, and 85% by 2030. Recently, the EU-28 reach a recycling rate of 85% for paper and cardboard packaging. This means that most member states comfortably meet the EU recycling targets.

Recycling rates have to be calculated as the mass ratio of sorted and cleaned material entering the recycling facility. It will be no longer possible to report collection rates as recycling rates.

The EU stipulates that in all Member States EPR schemes must exist for all packaging by the end of 2024. This criterion is met by all EU member states except for Denmark, which nonetheless reaches high recycling rates for paper and cardboard packaging.

Moreover, directive 94/62/EC defines design requirements for packaging: “Packaging shall be designed, produced and commercialised in such a way as to permit its reuse or recovery, including recycling,..”. This has consequences for the carton industry, due to the poor recyclability of many laminated boxes and composite cans.

### EXTENDED PRODUCER RESPONSIBILITY FOR PACKAGING

Most European countries have EPR schemes for packaging. The distributors of packaged goods must take responsibility for the packaging waste produced. Usually, the distributors assume their responsibility by paying into a system that handles the collection, sorting and recycling of packaging waste. In some countries (eg Ireland) packaging producers are also required to participate. These systems are referred to as take-back systems. Ideally, the costs for the collection, sorting and reprocessing of packaging are covered by the fees, which are paid into these systems.

Take-back systems are very different in Europe. In some countries there are monopolistic take-back systems (eg Croatia, Italy, Ireland, Spain), in other countries there is a competition between different take-back systems (eg Great Britain, Germany). In Hungary and Croatia, a packaging tax is payable to a government agency, but in most states a royalty is paid to a privately organized take-back system. Several, but not all, take-back systems offer their customers the green dot designation.

However, such take-back systems for all packaging do not exist in all European countries. For example, in Denmark and Switzerland, such obligations exist only for beverage containers made of glass, aluminium and PET, but not for paper packaging.

Essential for companies that use paper and cardboard packaging is the distinction between the categories "paper & cardboard packaging" on the one hand and "composite packaging" on the other hand. In most cases, higher royalties are payable on composite packaging. However, in many countries there is no composite packaging category and cardboard composite packaging is licensed as "paper". Regarding the categorization, it usually makes no difference, with which material the cardboard is combined. In most countries, the categorization merely depends on the proportion of fibres in the packaging. However, there are some exemptions from this rule (eg. Austria).

The EU stipulates that in all Member States such EPR schemes must exist for all packaging by the end of 2024 (Directive 94/62/EC, as amended, Article 7).

Table 2 in ANNEX B gives an overview of the take-back systems in the selected EU countries. The listed take-back systems are merely exemplary. Due to the large number of take-back systems (there are 49 different providers in Great Britain!), a complete list of take-back systems in this context does not make sense.

Take-back systems for paper packaging also exist outside the EU. In Russia, producers and importers are responsible for the recycling of goods and packaging after use if they contain recyclable components. If companies do not meet this obligation themselves, they will have to pay an environmental fee. Decree No. 2970-r dated 28.12.2017 specifies a list of goods for which an environmental fee is payable to the Federal Environmental Protection Agency Rosprirodnasor. Table 3 in ANNEX B gives an overview of non-EU states with take-back systems.

The various take-back systems in Europe are characterized by a great inconsistency. This also applies to the categories in which packaging can be grouped for licensing. While there is a category for paper packaging in all countries, this is not the case for composites. In many countries, packaging needs to have a defined minimum fibre content to be classified as paper packaging.

There are three basic categories for cardboard composite packaging:

- **Paper packaging (PAP):** In many countries, all packaging, which is predominantly paper, falls into this category. In other countries, a minimum fibre content for paper packaging is defined
- **Composite:** In some countries, composite cartons are considered composite if the minimum fibre content is not achieved
- **Split:** The paper fraction is to be licensed as paper, the plastic fraction as plastic

The classification of exemplary cardboard composites in the selected countries is presented in detail in ANNEX C Table 4. If relevant, the minimum fibre content, that qualifies a cardboard composite packaging as paper packaging, is specified. For example, composite packaging with a fibre content of over 80% is licensed as paper in Austria; if the fibre content is below 80%, the packaging must be licensed as a composite. In some countries, all paper-based composite packaging falls into the paper



category when paper is the predominant material. For some countries, the criteria for a classification as paper could not be raised (no information available – n/a).

Licensing prices for the different packaging materials have to be requested directly from the return system. Sometimes, the price per kilogram of packaging also depends on the total amount of packaging that a company wants to license. PRO Europe gives an overview of fees in different European countries (PRO Europe, 2019).

In **Austria**, paper coated on both sides, and paper coated or impregnated with paraffin or wax on one or both sides is considered a composite, even if the fibre content exceeds 80%.

In **France**, it is possible to fully license paperboard packages with viewing windows as paper packaging if the fibre content of the entire packaging exceeds 80%. Alternatively, the cardboard can be licensed as paper, and the viewing window separately as plastic. If the fibre content is less than 80%, the different materials must be licensed separately.

In **Sweden**, paper-based composites (eg. beverage cartons) are currently also classified as paper. That will change from 2020 onwards, as an additional category for paper-based composite packaging will be introduced.

The take-back system will also be reformed in the **United Kingdom**. There has been widespread criticism that the royalties for hard-to-recycle packaging is too low, and the system is not cost effective. The Department for Environment, Food & Rural Affairs (DEFRA) calls for higher licensing fees, especially for hard to recycle composite packaging (DEFRA, 2019).

The legal situation in **Poland** is not entirely clear. Composite materials (Opakowania wielomaterialowe) are packages that consist of several different materials that are not easily separable by mechanical methods. According to information from the Polish Chamber of Commerce, cardboard composite packaging, such as coated frozen cartons, can be classified as a composite. Pure paper packaging can be licensed via REKOPOL. The Polish Chamber of Commerce, which operates the recycling system REKARTON, is responsible for composite packaging.

In the **Netherlands**, the fibrous fraction is licensed as paper, the plastic fraction as plastic.

The legal reporting requirements for EU member states will change. The Commission Implementing Decision (EU) 2019/665 states that *“For the purposes of calculating and verifying attainment of the recycling targets set in points (f) to (i) of Article 6(1) of Directive 94/62/EC, composite packaging and other packaging composed of more than one material shall be calculated and reported per material contained in the packaging. Member States may derogate from this requirement where a given material constitutes an insignificant part of the packaging unit, and in no case more than 5 % of the total mass of the packaging unit.”* (Article 6c - 2.).

## STATES WITHOUT EXTENDED PRODUCER RESPONSIBILITY SCHEMES FOR PAPER PACKAGING

**Denmark** is the only state in the European Union that does not have an EPR scheme for all packaging. The Dansk Retursystem is a deposit system for disposable beverage packaging (glass and PET bottles, cans). There is a separate packing tax for plastic bags, disposable tableware and PVC packaging. The municipalities are responsible for the collection and recycling of all other packaging (including cardboard composite packaging), for which they collect a general waste tax.

In **Switzerland**, there is also no system of extended product responsibility for all packaging. The beverage packaging regulation prescribes a recycling fee for one-way beverage packaging (glass and PET bottles, cans), which finances a collection and recycling system for these types of packaging. Paper packaging and beverage cartons are not subject to the recycling fee.

There is currently no licensing system for the recycling of packaging waste in **Ukraine**. The Ukrainian Cabinet of Ministers revoked on March 18, 2015 its Decree No. 95 of July 26, 2001, according to which the company "UkrEcoResoursy" was founded. The goal of the company "UkrEcoResoursy" would theoretically have been to set up a collection and recycling system for packaging waste. Since this did not work, and there were problems, this company was abolished again. In addition, the packaging tax was abolished. The recycling of packaging waste is currently not regulated by law. However, the Ukrainian Parliament has three alternative draft laws on waste recycling (as of June 2019). The disposal situation in Ukraine is problematic as there is hardly any recycling. Over 90% of household waste is disposed of in landfills. Several international companies (TetraPak, CanPack, Elopak, Nestle, Coca-Cola, etc.) have joined together to form the UkrPEC (Ukrainian Packaging & Environment Coalition) initiative.

## EU REGULATION OF RECYCLED FOOD CONTACT MATERIALS

Regulation (EC) No 1935/2004 on materials and articles intended to come into contact with food states that "The use of recycled materials and articles should be favoured in the Community for environmental reasons, provided that strict requirements are established to ensure food safety and consumer protection".

There is a widespread concern over the use of recycled paper for food packaging due to the risk of mineral oil derivatives migrating into the food. Nonetheless, the EU does not have harmonized legislation governing the use of food contact paper and board materials. Therefore, these materials must comply with the appropriate laws of each EU Member State, subject to the principle of mutual recognition, and this includes recycled paper as well. Some Member States have specific legislation or recommendations on food contact paper.

The German Federal Institute for Risk Assessment or Bundesinstitut für Risikobewertung (BfR) Recommendation 36 covers the use of paper and board for food contact applications. While the German BfR Recommendations are not legally binding, they are respected by industry throughout the EU. The annex to Recommendation 36 specifically addresses the use of recycled fibres as raw

materials for the production of paper. Pointing out that care must be used in selecting fibre sources with respect to potential migration of substances into food, the annex specifies migration limits for: primary aromatic amines, 4,4'-bis(dimethylamino)-benzophenone, phthalates (di-2-ethylhexyl phthalate, di-n-butyl phthalate, diisobutyl phthalate), benzophenone, bisphenol A and diisopropylnaphthalene.

## ANNEX A

TABLE 1

EU Member States	AT	Austria
	BE	Belgium
	BG	Bulgaria
	CZ	Czech Republic
	DE	Germany
	DK	Denmark
	EE	Estonia
	ES	Spain
	FI	Finnland
	FR	France
	GB	United Kingdom
	HR	Croatia
	HU	Hungary
	IE	Ireland
	IT	Italy
	LU	Luxemburg
	NL	Netherlands
	PL	Poland
	PT	Portugal
RO	Romania	
SE	Sweden	
Non EU States	CH	Switzerland
	NO	Norway
	RS	Serbia
	RU	Russia
	TR	Turkey
	UA	Ukraine

## ANNEX B

TABLE 2

EU countries			
	Take-back systems	Green dot	Link
AT	ARA	X	<a href="https://www.ara.at/">https://www.ara.at/</a>
	Reclay		<a href="https://www.reclay-group.com/at/de/">https://www.reclay-group.com/at/de/</a>
BE	Fost Plus	X	<a href="http://www.fostplus.be">www.fostplus.be</a>
BG	EcoPack Bulgaria Jsc	X	<a href="http://www.ecopack.bg/">http://www.ecopack.bg/</a>
	Ecobulpack		<a href="http://www.ecobulpack.com">www.ecobulpack.com</a>
CZ	EKO-KOM, a.s.	X	<a href="http://www.ekokom.cz/">http://www.ekokom.cz/</a>
	Reclay		<a href="https://www.reclay-group.com/at/de/">https://www.reclay-group.com/at/de/</a>
DE	Der Gruene Punkt - Duales System Deutschland	X	<a href="https://www.gruener-punkt.de/">https://www.gruener-punkt.de/</a>
	Reclay		<a href="https://www.reclay-group.com/at/de/">https://www.reclay-group.com/at/de/</a>
EE	ETO Estonia	X	<a href="http://www.eto.ee/">http://www.eto.ee/</a>
ES	Ecoembalajes España, S.A. (Ecoembes)	X	<a href="http://www.ecoembes.com">www.ecoembes.com</a>
FI	RINKI Ltd		<a href="http://www.rinki.fi">www.rinki.fi</a>
FR	CITEO	X	<a href="https://www.citeo.com/">https://www.citeo.com/</a>
GB	VALPAK		<a href="http://www.valpak.co.uk/">http://www.valpak.co.uk/</a>
	Scotpak		<a href="https://www.scotpak.eu/">https://www.scotpak.eu/</a>
HR	Environmental Fund (FZOEU)	X	<a href="http://www.fzoeu.hr/">http://www.fzoeu.hr/</a>
HU	National Waste Management Agency Nonprofit Ltd	X	<a href="http://www.szelektivinfo.hu/">http://www.szelektivinfo.hu/</a>
IE	Repak Ltd	X	<a href="http://www.repak.ie/">http://www.repak.ie/</a>
IT	CONAI (Consorzio Nazionale Imballaggi)		<a href="http://www.conai.org/">http://www.conai.org/</a>
LU	VALORLUX Asbl	X	<a href="http://www.valorlux.lu/">http://www.valorlux.lu/</a>
NL	Afvalfonds Verpakkingen	X	<a href="http://www.afvalfondsverpakkingen.nl/">http://www.afvalfondsverpakkingen.nl/</a>
PL	Rekopol	X	<a href="https://www.rekopol.pl/">https://www.rekopol.pl/</a>
	Rekarton		<a href="http://www.rekarton.pl/">http://www.rekarton.pl/</a>
	Interseroh		<a href="https://www.interseroh.pl/">https://www.interseroh.pl/</a>
PT	Sociedade Ponto Verde, S. A. (SPV)	X	<a href="http://www.pontoverde.pt">www.pontoverde.pt</a>
RO	ROMPACK		<a href="http://www.rompacksa.ro/">http://www.rompacksa.ro/</a>
	ECO-ROM Ambalaje	X	<a href="http://www.ecoromambalaje.ro">www.ecoromambalaje.ro</a>
SE	FTI		<a href="http://www.ftiab.se/">http://www.ftiab.se/</a>

**TABLE 3**

non-EU countries			
	Take-back systems	Green dot	Link
<b>NO</b>	Grønt Punkt Norge	X	<a href="https://www.grontpunkt.no/">https://www.grontpunkt.no/</a>
<b>RS</b>	Sekopak	X	<a href="http://www.sekopak.com/">http://www.sekopak.com/</a>
	EKOStarPAK		<a href="https://www.ekostarpak.rs/">https://www.ekostarpak.rs/</a>
<b>RU</b>	ROSPRIRODNADSOR		<a href="http://rpn.gov.ru/">http://rpn.gov.ru/</a>
<b>TR</b>	Cevko	X	<a href="http://www.cevko.org.tr/index.php?lang=tr">http://www.cevko.org.tr/index.php?lang=tr</a>

# ANNEX C

TABLE 4

		AT	BE	BG	CZ	DE	DK	EE	ES	FI	FR	GB	HR	HU
Minimum fibre content		80%	85%	95%	70%	95%	x	predominant	predominant	50%	80%	predominant	n.a.	90%
Functional barrier cans	Examples													
Spiral wound composite can - w 77% fibre (incl. metal bottom)	Potato crisps	COM	PAP COM	COM	PAP	COM	no EPR	PAP	PAP	PAP	Split	PAP	COM	COM
Composite can system - w 77% fibre	CekaCan	COM	PAP COM	COM	PAP	COM	no EPR	PAP	PAP	PAP	Split	PAP	COM	COM
Composite cans for liquids														
Can w 70% fibre	CartoCan	BC	BC	COM	BC COM	BC	no EPR	PAP	BC	BC	BC	PAP	BC	BC
Can w 67% fibre and metallised PET	CartoCan	BC	BC	COM	BC COM	BC	no EPR	PAP	BC	BC	BC	PAP	BC	BC
Multimaterial Cardboard Packaging														
Rigid box w 98% fibre	Rigid box for luxury products with matt varnishing and gold foil stamping	PAP	PAP	PAP	PAP	PAP	no EPR	PAP	PAP	PAP	PAP	PAP	COM	PAP
Carton, inner side coated with PE w 94% fibre	Frozen food carton	PAP	PAP	COM	PAP	COM	no EPR	PAP	PAP	PAP	PAP	PAP	COM	PAP
Window carton w 78% fibre	Corrugated box with PVC viewing window and plastic handle for fruits	COM	PAP COM	COM	PAP	COM	no EPR	PAP	PAP	PAP	Split	PAP	COM	COM
Window carton w 94% fibre	Cardboard with PP window for fresh berries	PAP	PAP	COM	PAP	COM	no EPR	PAP	PAP	PAP	PAP Split	PAP	COM	PAP
Paper Cups														
coffee cup, inner side coated with PE w 94% fibre	SEDA cup	PAP	PAP	COM	PAP	COM	no EPR	PAP	PAP	PAP	PAP	PAP	COM	PAP
yoghurt cup, inner side coated with PE w 82% fibre	SEDA cup	PAP	PAP COM	COM	PAP	COM	no EPR	PAP	PAP	PAP	PAP Split	PAP	COM	COM

PAP	paper, cardboard
PAP	Assumption paper, cardboard
BC	beverage carton
PLA	plastics
Split	licensing of separate material categories
COM	composite material
Other	other materials / average license fee
PAP COM	paper composite material
n.a.	not available

		IE	IT	LU	NL	PL	PT	RO	SE	NO	RS	RU	TR
Minimum fibre content		n.a.	predominant	85%	n.a.	n.a.	predominant	predominant	predominant	predominant	predominant	n.a.	n.a.
Functional barrier cans	Examples												
Spiral wound composite can - w 77% fibre (incl. metal bottom)	Potato crisps	PAP	PAP	Others	Split	COM	PAP Split	PAP	PAP	PAP	PAP	n.a.	PAP COM
Composite can system - w 77% fibre	CekaCan	PAP	PAP	Others	Split	COM	PAP Split	PAP	PAP	PAP	PAP	n.a.	PAP COM
Composite cans for liquids													
Can w 70% fibre	CartoCan	PAP	BC	BC	Others BC	COM	BC	PAP	PAP	BC	PAP	n.a.	COM
Can w 67% fibre and metallised PET	CartoCan	PAP	BC	BC	Others Split	COM	BC	PAP	PAP	BC	PAP	n.a.	COM
Multimaterial Cardboard Packaging													
Rigid box w 98% fibre	Rigid box for luxury products with matt varnishing and gold foil stamping	PAP	PAP	PAP	Split	COM	PAP Split	PAP	PAP	PAP	PAP	PAP	PAP
Carton, inner side coated with PE w 94% fibre	Frozen food carton	PAP	PAP	PAP	Split	COM	PAP Split	PAP	PAP	PAP	PAP	PAP	PAP
Window carton w 78% fibre	Corrugated box with PVC viewing window and plastic handle for fruits	PAP	PAP	Others	Split	COM	PAP Split	PAP	PAP	PAP	PAP	PAP	PAP
Window carton w 94% fibre	Cardboard with PP window for fresh berries	PAP	PAP	PAP	Split	COM	PAP Split	PAP	PAP	PAP	PAP	PAP	PAP
Paper Cups													
coffee cup, inner side coated with PE w 94% fibre	SEDA cup	PAP	PAP	PAP	Split	COM	PAP Split	PAP	PAP	PAP	PAP	PAP	PAP
yoghurt cup, inner side coated with PE w 82% fibre	SEDA cup	PAP	PAP	Others	Split	COM	PAP Split	PAP	PAP	PAP	PAP	PAP	PAP COM

PAP	paper, cardboard
PAP	<u>Assumption</u> paper, cardboard
BC	beverage carton
PLA	plastics
Split	licensing of separate material categories
COM	composite material
Other	other materials / average license fee
PAP COM	paper composite material
n.a.	not available



## LITERATURE OVERVIEW

Bundesinstitut für Risikobewertung (BfR): Recommendations 36 – Papiere, Kartons und Pappen für den Lebensmittelkontakt, 2017;

<https://bfr.ble.de/kse/faces/resources/pdf/360.pdf;jsessionid=BC8EBD5D322F2778285E87F2CEC71108>

Confederation of Paper Industries (CPI): Paper and Packaging Recyclability Guidelines, 2020

[https://paper.org.uk/PDF/Public/Publications/Guidance%20Documents/CPI%20Recyclability%20Guidelines%20Revision%201\\_Jan2020.pdf](https://paper.org.uk/PDF/Public/Publications/Guidance%20Documents/CPI%20Recyclability%20Guidelines%20Revision%201_Jan2020.pdf)

Department for Environment, Food & Rural Affairs (DEFRA): Consultation on reforming the UK packaging producer responsibility system, 2019; [https://consult.defra.gov.uk/environmental-quality/consultation-on-reforming-the-uk-packaging-produce/supporting\\_documents/packagingprconsultdoc.pdf](https://consult.defra.gov.uk/environmental-quality/consultation-on-reforming-the-uk-packaging-produce/supporting_documents/packagingprconsultdoc.pdf)

[https://consult.defra.gov.uk/environmental-quality/consultation-on-reforming-the-uk-packaging-produce/supporting\\_documents/packagingprconsultdoc.pdf](https://consult.defra.gov.uk/environmental-quality/consultation-on-reforming-the-uk-packaging-produce/supporting_documents/packagingprconsultdoc.pdf)

European Parliament & Council: Commission Implementing Decision (EU) 2019/665

European Parliament & Council: Directive 94/62/EC on packaging and packaging waste (in the version of 04.07.2018)

OPRL LTD & CPI: Joint CPI/OPRL public line on Recycling Labelling Rules 2019, 2020

PRO Europe: License fees, 2019; <https://www.pro-e.org/the-green-dot-trademark/licence-fees>