

EU Single-Use Plastic Directive: Any impact on paper manufacturing and converting?

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INTRODUCTION:

Although the title of the Directive suggests regulations for plastic, the impact on the design of fibre-based products like paper and board could be significant.

Pictures of plastic items on beaches and floating patches of plastic garbage in the oceans have raised public awareness. Moreover, consumers and legislators are concerned about the decomposition of plastic items into secondary microplastics and their impact on the environment, food chain and the still uncertain impact on human health. Based on the “Green Deal”, the European Commission now set up a regulatory framework to lead the European economy into a sustainable future by transforming it into a circular economy.

One step towards this goal is the Directive (EU) 2019/904 (Single-Use Plastics Directive) [1] on the reduction of the impact of certain plastic products on the environment.

The defined objectives of the Directive are exactly “to prevent and reduce the impact of certain plastic products on the environment, in particular the aquatic environment, and on human health, as well as to promote the transition to a circular economy with innovative and sustainable business models, products and materials, thus also contributing to the efficient functioning of the internal market” (Article 1) [1].

Within EU law, Directives must be transposed into national law by EU countries. The European Commission verifies that EU countries communicate all national implementing measures and that they fully and correctly incorporate the provisions of a Directive into national law. This needs to be done by the deadline set in the Directive. For the single use plastic Directive, the states should have brought into force the laws, regulations and administrative provisions necessary to comply with the restrictions on placing on the market and marking requirements of the Directive by July 3rd, 2021.

That means after the transposition into national law many single-use plastic products are banned within the EU from said date. As of the 3rd July 2021 a number of other products shall be labelled with a specific warning about plastic-induced environmental hazards. This is further specified by the Commission Implementing Regulation (EU) 2020/2151 [2] which lays down rules on harmonised marking. There have been numerous controversial debates as well as many different suggestions for definitions, until the final version of the Commission guidelines on single-use plastic products (2021/C 216/01) [3] regarding the interpretation of the provisions set forth in the Directive was finally agreed upon and published in June 2021. In Germany in 2020 and 2021 some of the regulations were transposed by the Single-Use Plastics Ordinance – EWKVerbotsV [4] and Single-Use plastic marking ordinance – EWKKennzV [5] (refer to Fig. 1).

During the Impact Assessment accompanying the European Commission’s proposal for this Directive paper-based products without plastic lining or coating have been identified as available, more sustainable alternatives to single-use plastic products.

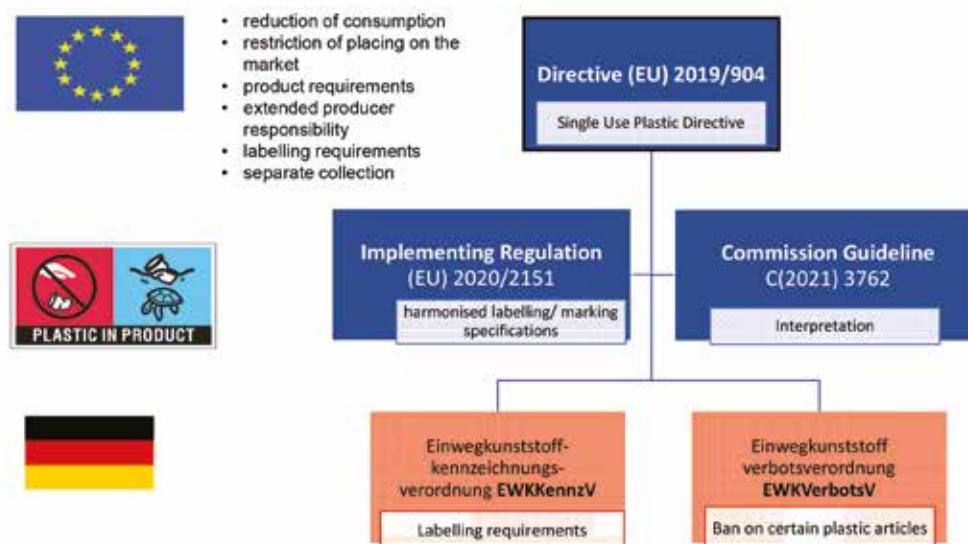


Figure 1: Directive (EU) 2019/904 “Single Use Plastics” – Hierarchy of legal acts

The question arises: are fibre-based products concerned by single use plastic measures at all? To evaluate that, the following definitions are to be considered:

“Single-use plastic product” means a product that is made wholly or partly from plastic and that is not conceived, designed or placed on the market to accomplish, within its life span, multiple trips or rotations by being returned to a producer for refill or re-used for the same purpose for which it was conceived. A product that is a single-use product by its design and its material characteristics cannot simply be re-declared a multi-use product.

“Plastic” within the scope of the SUPD means a material consisting of a polymer as defined in point 5 of Article 3 of the Regulation 1907/2006 (REACH), to which additives or other substances may have been added, and which can function as a main structural component of final products, with the exception

plastic product; a lower threshold for a mass percentage does not exist. Therefore, a qualitative assessment is to be applied. According to the current interpretation, papers or board with any plastic coating or lining are within the scope of the Directive. Illustrative examples for different products can be found in the annex of the Commission Guidelines [3].

Coatings or linings with natural, non-chemically modified polymers (e.g. native starches, microfibrillated cellulose MFC, nanocellulose, lyocell, viscose) do not contain “plastic” and won’t be affected by the Directive. The guideline in its final version clearly states that regenerated cellulose, e.g. in the form of a viscose, lyocell or cellulose film, is not considered to be chemically modified. However, polymers obtained by artificial cultivation or fermentation processes in the industry, e.g. polyhydroxyalkanoates (PHAs) or polylactic acid (PLA), are not considered natural polymers,



Figure 2: Examples for some products which are affected by Single-Use Plastic regulations

of natural polymers that have not been chemically modified; REACH defines polymer as a “substance consisting of molecules characterised by the sequence of one or more types of monomer units [...]”.

Single-use paper and board products that are solely made from paper and board and do not include any plastic lining or coating do not count as single-use plastic products for the purposes of the SUPD. The use of synthetic polymer additives – “e.g. retention agents, binders and processing aids” - does not transform paper and board into a “plastic”-containing product, as the Guidelines [3] declare.

However, “when a plastic coating or lining is applied to the surface of a paper or board-based [...] material to provide protection against water or fat, the final product is considered a composite product that is composed of more than one material, one of which is made of plastics”. The Directive does not envisage any de minimis threshold for the plastic content in a single-use product to determine whether or not that product is covered by the definition of single-use

because they are not the result of a polymerisation process that has taken place in nature. Also, chemically modified natural polymers (cellulose ethers/ esters like cellulose acetate, starch esters/ ethers like cationic starch, or the like) are deemed to be plastics under the regulatory framework when used for single-use products.

According to the current interpretation of the definition of “plastic” as “polymer” according to REACH, also silicones as coatings for paper/board are defined as plastics. This is worth highlighting, because silicones are explicitly not regulated within the FCM section of the “Plastics” Commission Regulation (EU) No. 10/2011 [6].

It does not matter whether the polymers used for coatings or linings are biobased, biodegradable or recyclable in the repulping of paper and board production – if they are considered as plastics according to the SUPD definition, the final product will partly be made of plastic and is therefore regulated by the Directive and corresponding national laws.

What about the impact on paper converting?

Besides coating or lining there are several other processing steps for paper converting like printing (e.g. radiation-curing polymerising inks, UV varnishes) or gluing (dispersion adhesives, hotmelts). These steps could introduce other “plastic” ingredients to paper based products. However, according to recital No 11 of the Directive [1] and confirmed by the Commissions Guidelines text [3], paints, inks and adhesives should not be addressed by the Directive and therefore these polymeric materials should not be covered by the definition. Interestingly, varnishes are not mentioned explicitly – however, if you follow the definitions from the Draft of the German twenty-first Ordinance amending the Consumer Goods Ordinance (Bedarfsgegenständeverordnung) [7] which defines “printing inks” as printing inks or printing varnishes, or the EuPIA definition [8] of printing inks which states that besides mixtures of colourants [...] also other coloured or uncoloured overprint varnishes which are normally applied in combination with mixtures of colourants fall within the definition of “printing ink” - then printing varnishes should be excluded from the scope of the SUPD as well.

In addition to paper-based packaging, other fibre-based products may be concerned by the current regulations, e.g. certain wet wipes which are made of a mixture of viscose/lyocell (regenerated cellulose) and polyester /other synthetic polymer fibres (PET; PE) or cigarette filters that contain cellulose acetate. Many examples are illustrated within the Guidelines [3].

Apart from the ban of certain products such as cotton bud sticks, cutlery (especially forks, knives, spoons, chopsticks), plates, straws, beverage stirrers, support sticks to be attached to balloons, food containers made of expanded polystyrene, or products made from oxo-degradable plastic, the Directive also provides for a consumption reduction on certain products and packagings by 2026

as compared to the condition in 2022. These products include cups for beverages, inclusive of their covers and lids, and food containers (receptacles such as boxes for food) intended for immediate consumption either on-the-spot or take-away, if the food is consumed from the receptacle and without any further preparation, e.g. without cooking, boiling, heating.

Moreover, the extended producer responsibility requires producers to establish and take over the cost for raising customer awareness for packaging waste and return systems (collection, transport, treatment).

Within the scope of raising customer awareness, single-use plastic products must bear a clearly visible, clearly legible and indelible marking “plastic in product” as of 3rd July 2021. A transitional provision allows products to be marked with labels for a transitional period ending July 2022. Specific symbols (refer to Fig. 1 for an example) for single-use plastic markings are prescribed and provided as pictograms in different formats and languages on the Commissions website.

Some grey zones for interpretation of SUPD still remain

One of the remaining grey zones are “barrier varnishes” made of synthetic polymers, which are applied to paper and board - not for protection of the printing or to extent the gloss, but to achieve a barrier effect e.g. against oxygen, moisture or fat. Furthermore, the definition of “coating and lining” is not unambiguous, as illustrated by the example of water-based dispersion coatings which contain “plastic” ingredients. By this coating technology dispersions containing natural or synthetic polymeric material are applied to the substrate via coating machines and impregnate the surface of the substrate. In the case of the porous structure of paper surface it does not necessarily form a distinct separate layer, but protects the substrate against water or fat.

Other Actions within the Single Use Plastics Directive

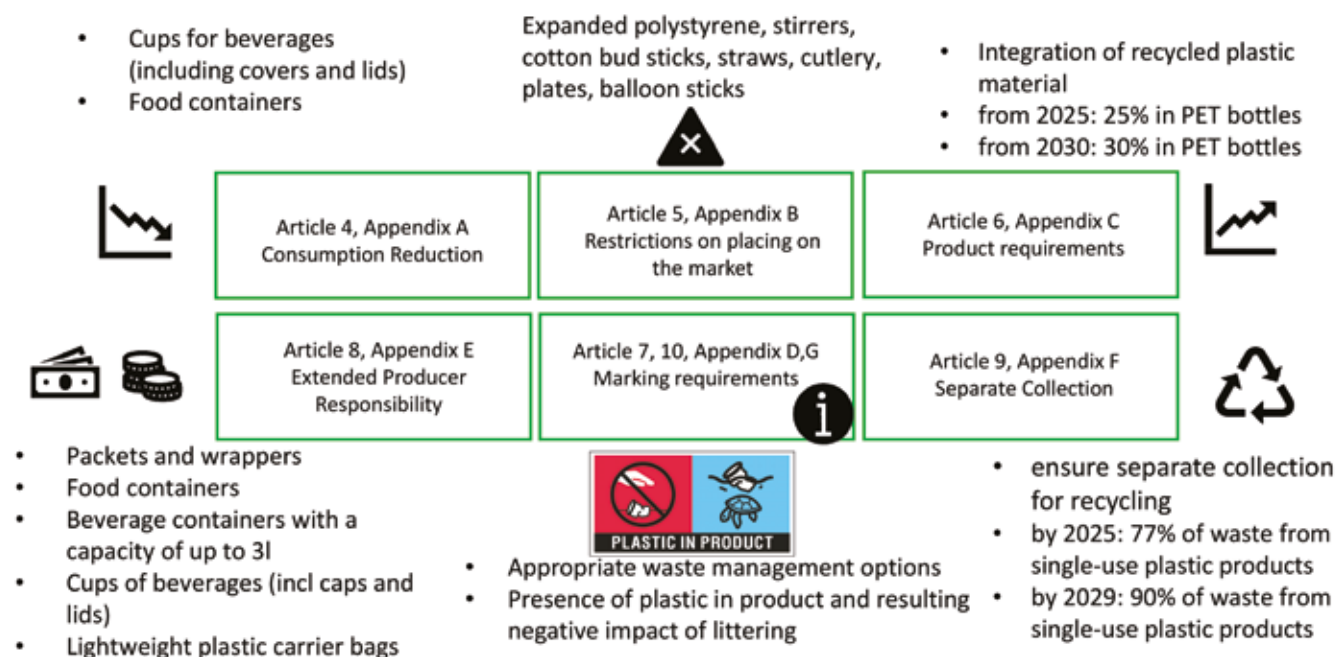


Figure 3: Impact on final articles according to Single Use Plastics Directive 2019/904

To make it even more complicated: there are several examples of polymers which are used for different purposes in paper production: e.g. polymer and copolymers of acrylic acid are used as retention agents (BfR Recommendation XXXVI, Part B Production Aids, III Retention agents, No. 1.b) as well as for surface refining and coating (BfR Recommendation XXXVI Part C, Special paper refining agents, IV Surface refining and coating agents, No. 27) [9]. Is the relevant difference the application site surface versus paper pulp? Some national authorities are still in lively discussions with EC on interpretation of these special issues for paper and board. If paper and cardboard were considered as sustainable alternatives for plastic, are these detailed questions possibly negligible? On the other hand, there is no lower threshold for "plastic" and thus the discussion becomes somewhat philosophical. Consequently, the general question remains: what was the regulatory intention?

Enforcement of the rules

Due to many "grey zones" legal disputes are to be expected. However – at least in Germany – it is somewhat unclear how the local competent authorities of the federal states (e.g. the municipal waste management authorities) will be enabled to enforce the rules. Presumably it will not be possible to solve the task technically without administrative assistance by analytical investigations.

The interpretation of EU law is the sole preserve of the Court of Justice of the EU. For interpretation, it is good advice to follow the methods of interpretation of the European Court of Justice (ECJ):

First, literal interpretation looks to the text and wording of the law (in all languages). Second, systematic interpretation denotes reference to the context of the law. Third, teleological interpretation, also called functional or purposive interpretation, constitutes the method by which the Court engages in the process of interpreting provisions of Community law by choosing "the interpretation which best serves the purpose for which the provision was made".

To the authors personal opinion there is a need for immediate clarification, to provide paper producers and converters with a legally secure basis for the intended innovations. With regard to sustainability, prevention of persistent waste/littering and improving a circular economy - maybe greater attention should be paid to biodegradability as well as best recyclability of products than it is currently the case.

Without a doubt, there are opportunities for the paper industry. There is an enormous need and demand for alternative, sustainable paper-based products. Recently the French Government has announced plans to ban plastic packaging for fruit and vegetables weighing less than 1.5 kg from January 1st, 2022 – again the next need for paper-based packaging, which prevents food from being contaminated. Future developments are promising to remain exciting.

About PTS

Papiertechnische Stiftung (PTS) is the applied research and service institute for the German paper industry located in Heidenau near Dresden, Germany. PTS will gladly be your partner for consultation, advanced training and testing of alternative product developments that are outside the scope of SUPD but will provide the desired barrier effect against grease, water vapour or migrating substances, and will of course be compliant with food law and recyclable. Laboratory and pilot plants, as well as a broad portfolio of measuring and testing services are available.

References

- [1] Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment
- [2] Commission Implementing Regulation (EU) 2020/2151 of 17 December 2020 laying down rules on harmonised marking specifications on single-use plastic products listed in Part D of the Annex to Directive (EU) 2019/904 of the European Parliament and of the Council on the reduction of the impact of certain plastic products on the environment (Text with EEA relevance)
- [3] Commission guidelines on single-use plastic products in accordance with Directive (EU) 2019/904 of the European Parliament and of the Council on the reduction of the impact of certain plastic products on the environment (2021/C 216/01), Official Journal of the European Union, 07.06.2021
- [4] German Ordinance of the Federal Government Ordinance prohibiting the placing on the market of certain single-use plastic products and products made from oxo-degradable plastic (Single-Use Plastics Ordinance – EWKVerbotsV)
- [5] German Ordinance of the Federal Government Ordinance regulating the nature and marking of certain single-use plastic products (Single-Use plastic marking ordinance – EWKKennzV)
- [6] Commission regulation (EU) No 10/2011 of 14 January 2011 on plastic materials and articles intended to come into contact with food, current consolidated version: 23/09/2020
- [7] Draft Twenty-First Ordinance amending the Consumer Goods Ordinance – Notified version, 28.06.2017
- [8] EuPIA Guideline on Printing Inks applied to Food Contact Materials April 2020
- [9] Federal Institute for Risk Assessment (BfR) Recommendation XXXVI. Paper and board for food contact, 01.04.2021