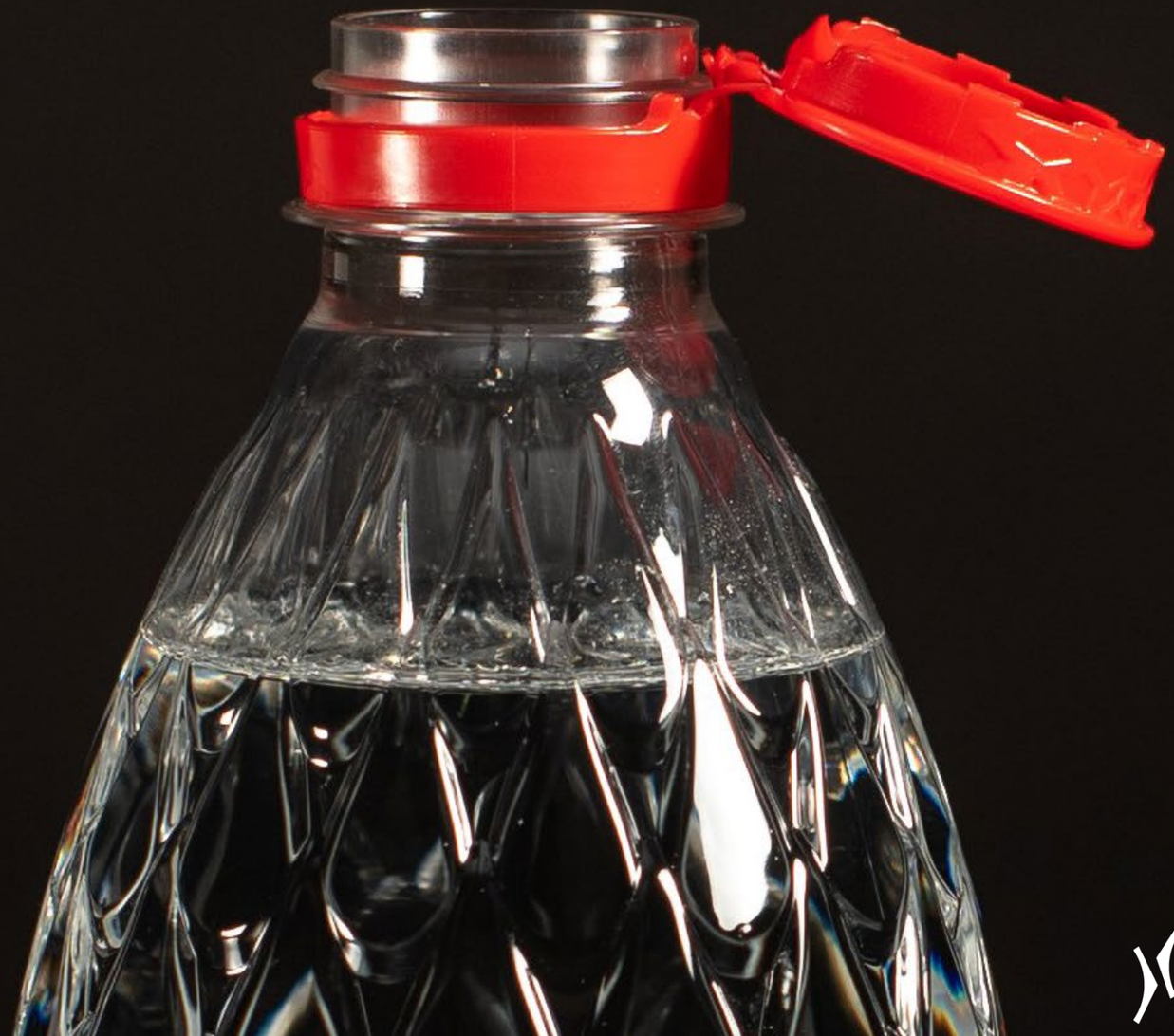
Tethered caps and use of recyclate – the situation in the EU (12/20)



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1. Initial situation

Plastic is facing increasing criticism particularly, though not exclusively, due to its use in packaging. The mass of man-made articles is currently beginning to exceed the biomass on our planet.[1] One of the most visible consequences of this is the waste pollution in our environment and oceans.

To tackle this problem, private initiatives have been created on the one hand, such as the internationally established Ellen MacArthur Foundation.[2] On the other hand, legislators are also introducing appropriate measures. In the EU, such measures are combined in the SUP (Single Use Plastic) EU Directive 2019/204.[3]

[1] Erik Stokstad (2020): “Human ‘stuff’ now outweighs all life on Earth”. https://www.sciencemag.org/news/2020/12/human-stuff-now-outweighs-all-life-earth?utm_source=Nature+Briefing&utm_campaign=4b1a5638bc-briefing-dy-20201210&utm_medium=email&utm_term=0_c9dfd39373-4b1a5638bc-45107078
[2] https://www.ellenmacarthurfoundation.org
[3] https://eur-lex.europa.eu/eli/dir/2019/904/oj

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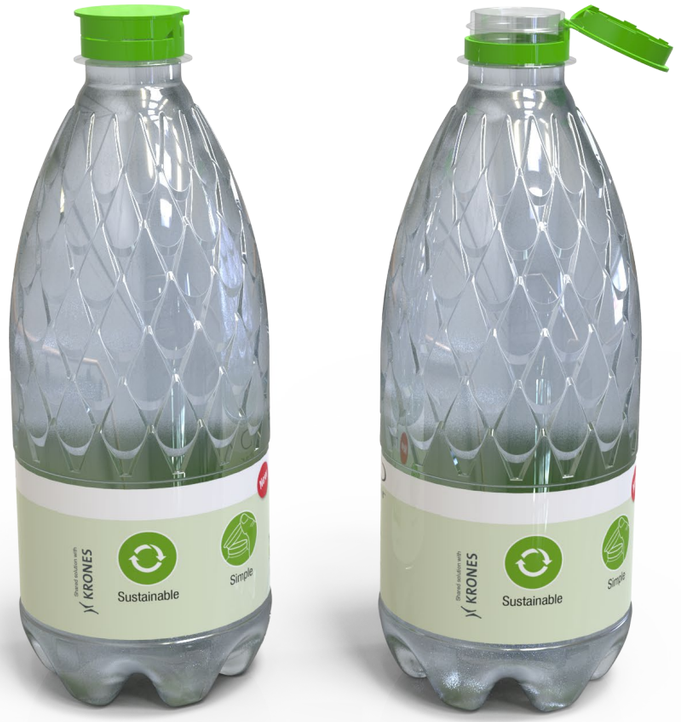
2. Core content of the EU directive

In addition to reducing consumption (Article 4), a ban on certain disposable plastic articles, including cotton buds made of plastic (5), and the manufacturer having to take on more responsibility (8), there are two points which are of particular interest to producers and distributors of beverage packaging.

Specific product requirements are set out in Article 6 and collection rates in Article 9:

Article 6 in more detail:
First of all: The prescribed minimum percentages of recyclate
Secondly: Design of the container closure system as a “tethered cap”



2.1 Recyclate percentages and collection rates

The EU timetable envisages an increase in the percentage of recyclate contained in plastic beverage bottles (Article 6). The collection rates for plastic waste originating from non-returnable plastic articles should also increase (Article 9):

	Recyclate percentage	Collection rate*
As of 2025	25 percent	77 percent
As of 2030	30 percent	90 percent

*The collection rate is currently approximately 55 percent.

These percentages refer to the overall market of the respective member states, meaning they need to be reached in every member state, not simply as an EU average.

KRONES is in a good position to achieve this: A recyclate percentage of 100 percent is easily manageable with an adequate material quality. Many of our customers are already using it today for individual product lines.

However, the availability of recyclate of adequate quality is problematic here. The system covering the collection of used container packaging needs to catch up with demand and it is also here that the measures indicated in Article 9 need to be enforced. However, collection improvements are currently being planned and corresponding legislation is being introduced in various member states.[4] Companies that wish to determine the quality of their recyclate themselves are well advised to choose a recycling system from KRONES.[5]

[4] Take the introduction of bottle deposit systems in Slovakia for example: https://spectator.sme.sk/c/22210435/slovakia-will-introduce-deposits-on-pet-bottles-and-cans-in-2022.html
[5] https://www.krones.com/en/products/complete-solutions/pet-recycling-systems.php

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2.2 Connected caps: “Tethered caps”

To ensure that the closures on beverage containers no longer get lost so easily and end up as waste in the environment, as of 2024 they will have to remain connected (tethered) to the packaging once opened. Precise regulations are currently being drawn up regarding the technical design of these caps. The European committee for CEN standardisation and the international association CETIE are the main bodies being employed to do so.

As a supplier of technology to the industry, KRONES is currently working on these issues as part of the CETIE team – even if we do not supply any bottle caps or cap tools ourselves. We also work in close collaboration with a number of different cap manufacturers.[6]

From a (mechanical) engineering viewpoint, a variety of tethered caps are permitted as a general rule.

[6] See here for example: https://blog.krones.com/en/till-recycling-do-us-part

3. Tethered caps: What variants are available?

Generally speaking, tethered caps can be split into two groups: flip-top caps and screw caps.

Flip-top caps – also known as flip lids, flip tops or thumb-ups – have a design which keeps them permanently connected to the bottle right from the outset. They are normally suitable for non-carbonated beverages or low internal container pressures.

3. Tethered caps: What variants are available?

In contrast, with today's screw caps, the connection between the container and the cap is broken when used correctly. However, screw caps are needed to seal bottles above a certain bottle interior pressure. This means that the cap can only stay connected to the container if an additional feature is included.

The outer contour of the cap may have a rotationally symmetrical exterior shape in both options, so that the cap can be accommodated in the cap retainers usually found in today's cappers

The shape can also deviate from a rotationally symmetrical round shape, for example due to hinge designs. In such cases, special gripper heads must be used in the closer. KRONES offers just the right sorting and capping technology for every variant.

4. Tethered caps: Anticipated costs

From a recycling viewpoint, the use of tethered caps is not accompanied by a great number of changes. This is because the PET fraction, i.e. the bottles, and the PE fraction, meaning the caps, are run through a mill before separation. The mill grinds up the material and, even today, already separates any cap tamper-evident bands remaining on the bottles.

Many of the cap solutions currently in development are based on the neck finishes established on the market today, for example the PCO 1881. For beverage system operating companies, this means that there is a good chance that a change-over to tethered caps can go ahead with a relatively low investment. At least if other characteristics do not need to be changed as well – for example a reduction in the neck or bottle weight.

Major investments will need to be made in the field of cap manufacturing or the required tool technology.

What is to be viewed negatively here is the investment to be made for this conversion and the additional limitation regarding the reduction of packaging weights, which will obviously accompany this additional technical requirement.

5. National implementation of the EU directive

However, it is still important to be aware that the regulations prescribed in the EU directive are stipulated for the EU member states. The member states still have to turn this stipulation into national law. As a result, the individual configuration could vary from country to country. This could then in turn lead to national laws and regulations that are in line with the EU directive deviating from the EU stipulations and being configured to be even stricter than the EU directive itself.

One possibility is, for example, that to achieve an average recyclate content of 30 percent of the national market, it is made obligatory for every PET bottle brought into circulation.

This is a similar situation to the one with the EU “plastic tax” introduced a short while ago, which will cost the member states 800 euros per tonne of non-recyclable plastic, but which may involve completely different laws on a national level.[7]

[7] https://www.consilium.europa.eu/media/45109/210720-euco-final-conclusions-en.pdf

6. Conclusion

All things considered, one must admit that the implementation of the respective EU directive is sure to create costs due to the necessary measures. These measures have, however, already been approached in the industry and a rule-consistent implementation of this directive is sure to be basically possible.

What remains therefore is the legitimate hope that these changes will actually result in a reduction in the amount of plastic waste introduced into our environment.

If you have any questions on this issue, please feel free to contact:

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