The EU Tethered Closure Regulation

A DISCUSSION ON THE BENEFITS AND ISSUES

AdeptGroup

ENGINEERING EXCELLENCE

Considerations for Compliance

The EU tethered closure regulation is well-known and thoroughly discussed within the beverage industry.

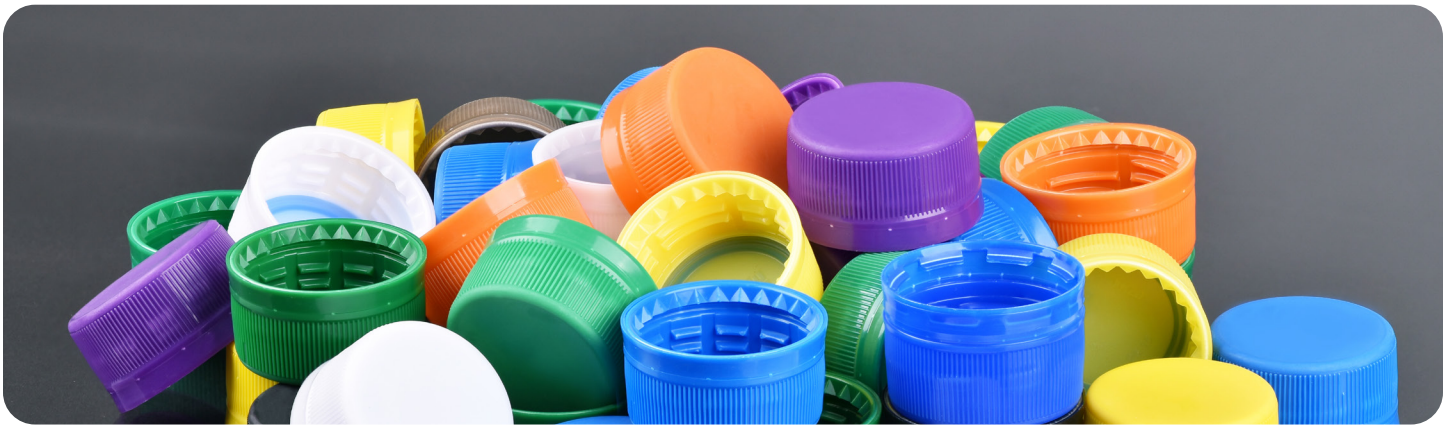
It has been the subject of articles, conferences and webinars as brand owners in the European Union prepare to comply. As brand owners work toward compliance, many questions arise, such as:

- What are the required activities for compliance?
- What needs to be done to ensure organizations meet the regulatory requirements?
- Will compliance bring other advantages to consumers in addition to the environmental benefits?
- Will the regulation bring about those intended environmental benefits?

THE DIRECTIVE TO-DATE

To recap advancements in the regulation to-date, the European Parliament passed a measure in March 2019 to reduce littering of single-use plastics and to further close the circular economy. The measure is part of the Single-Use Plastics Directive, specifically Article 6, and requires containers up to three liters in capacity, made of plastic or a plastic composite and using a plastic closure, to have a mechanism that ensures the closure cannot be detached from the container.

Compliance is required by July 2024. In addition, the directive includes other guidelines related to sustainability, such as targets for recycled content and other regulations impacting the tobacco and personal hygiene industries. Most of the regulatory requirements push ownership and responsibility of environmental issues back on to brand owners, which is a common theme observed on a global level.



Regulation Intentions

What Will the Directive Achieve?

The regulation is intended to reduce littering, a significant global problem.

It is estimated that on a global scale, 32% of plastic "leaks" out of the recycling system, meaning it is not collected, or is illegally disposed of.

Though this is a huge amount, 40% plastic that is collected is sent to a landfill. Wouldn't it be great to get that into a recycling stream?

THE PUSHBACK

As companies weigh the value of this directive, controversy arises when considering the following: though the regulation is focused on litter reduction, Europe isn't a primary source of plastic litter from a global perspective. Many European countries already have sophisticated end-of-life systems and educated users.

For example, in Germany 95% of bottles are already returned with the closures reapplied, while companies outside of the EU are responsible for most of the ocean litter. For example, an estimated 82% of ocean litter reportedly originates from Asia.

VALUE VS. COST

Another consideration is the value of the results versus the cost. The European Commission (EC) estimates that the single use plastics regulations, of which tethered caps is only one article, will avoid environmental damage which would cost nearly €22 billion, as well as save consumers a projected €6.5 billion in addition to the 3.4 million tons of CO_2 equivalent with this initiative.

In order to adequately achieve these changes, many modifications would need to be made on the manufacturing side. New tooling, changes to cappers and handling equipment, and new inspection equipment all require significant financial investment.

A study commissioned by the European soft drinks industry (UNESDA) and European Federation of Bottled Waters (EFBW) and conducted by PricewaterhouseCoopers concluded that tethered closure compliance could cost the European bottling industry up to €8.7 billion.

Many of the leading beverage companies, such as Coca-Cola, Danone, Nestle and PepsiCo believe the regulation should address other sustainable initiatives, such as improving existing recycling systems. As effected companies weigh the costs versus the benefits, many believe the results will not be significant enough to warrant the investment.

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Setting Clear Standards

The Need for Collaboration

This regulation is one of the biggest disrupters in the recent history of the European beverage industry, last seen during the introduction of the 1881 Bottle Finish Standard.

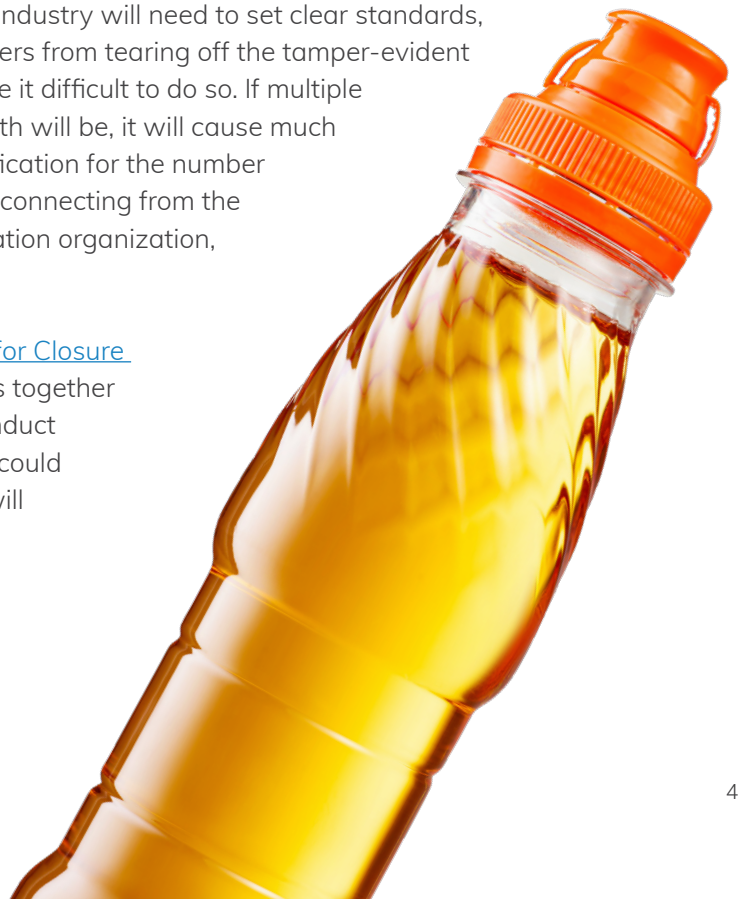
The major difference between the two transitions is the voluntary nature and cost-saving potential of the 1881 finish's introduction. The Tethered Closure Regulation is not voluntary, and many doubt its cost-saving potential. The 1881 finish adoption was a long-term process that built on knowledge from earlier development, starting with the Coca-Cola Regal closure and moving through various developments such as the Obrist double-threaded closure, before landing on the design we have now.

The 1881 standard and its performance requirements were very much a collaborative affair, with input from all major brand owners and suppliers. Even with the collaborative nature of this new standard, its adoption was long and troublesome for many organizations. It required a change in voluntary performance standards, namely removal torque specifications, and a lot of relearning in application conditions to establish the new finish and closure system.

Collaboration regarding the tethered closure regulation has not yet been established. Most brand owners are treating the development of solutions as confidential and keeping their learnings private.

In order to develop clear methods for implementation, the industry will need to set clear standards, which requires collaboration. For example, to stop consumers from tearing off the tamper-evident band, the tear-off force needs to be strong enough to make it difficult to do so. If multiple organizations have different thoughts on what that strength will be, it will cause much confusion in the industry. Similarly, the performance specification for the number of times a closure should be able to be opened without disconnecting from the tamper band must be standardized. European standardization organization, Cetie is reported to be working on this issue.

Luxembourg-based United Caps established the Alliance for Closure Tethering (ACT) with this collaboration in mind. ACT brings together stakeholders such as preform suppliers and bottlers to conduct an impact assessment of various tethering solutions. This could be a great start, but much greater levels of collaboration will be required to ensure success.



What Are the Current Solutions?

There is already some technology available from suppliers for the transition. Germany-headquartered closure manufacturer Bericap offers a tethering design that can be applied to various existing closure designs, including screw-on and push-on designs.

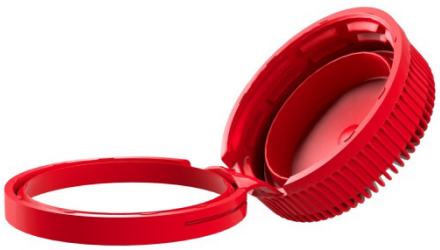
Source: https://www.bericap.com/en/Company/News/Press_releases_2019/Tethered_cap.php

Crystal Lake, Illinois-headquartered closure supplier Aptar leaned on existing technology to provide a solution for screw-on closures by licensing a tethering technology from Nippon Closure Co. in Japan. Aptar also launched a self-designed flip closure for still beverages that is designed to stay attached to bottles through what they call “Stay-With” technology.

Source: https://news.aptar.com/food-beverage/aptar-food-beverage-reinvents-packaging-for-tethered-caps-to-enhance-the-consumer-drinking-experience/

United Caps has three designs in its portfolio: a screw-off hinged closure for 26mm finishes, a flip top closure and a 28mm lasso band design.

Source: https://www.unitedcaps-innovations.com/tethered-closures/



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Available Technology

What Are the Current Solutions?

Nevada-based ThisCap Inc. offers a licensing opportunity with their patented slitting technology for existing closures, which can be applied to produce a tethering feature. This option may not be suitable for injection molded closures that are typically molded with the tamper evident feature rather than have it slit in.

Source: https://www.unitedcaps-innovations.com/tethered-closures/

The closures currently available are mainly for PET bottles, and the suppliers' capacity is currently unknown and presumably limited.

Options for cartons and other containers using plastic are scarcer and even more challenging for designers to create. The American Beverage Association (ABA) agrees with this assessment. In a 2018 article printed in Plastics News, a representative of the ABA was quoted as saying "Carbonated drinks and hot-fill drinks, which is what this bill provides for, still there is no technology available right now to provide for a tethered cap."

Closure Performance

A major difference to earlier disruptive trends is that, in the case of tethered closures, a change in the closure design is not coinciding with changes to the bottle finish designs.

Tethered closures for carbonated beverages will have to work on the same designs applied to current closures. This could mean compromises to performance and user experience, including:

- Tamper Evidence – Will it be easier for bad actors to remove closures without triggering a tamper evident feature?
- Application – If functionality depends on tighter bands, they may become harder to apply and result in higher occurrences of cocked or high-standing closures.
- Interference – Ensuring that the closure moves far enough away from the drinking area could be a major challenge.

To overcome potential issues, some suppliers may choose to provide custom finishes for their closures. This may be problematic, as it runs contrary to significant efforts within the beverage industry to standardize finishes.

Some manufacturers view this challenge as an opportunity to create their own solutions to the problems faced by brand owners and consumers. Closure manufacturer Aptar recognized the issue of interference and made sure their closure moves far enough away from the user's mouth. They believe hinged closures are a more intuitive solution for consumers and view them as a preferred solution over a 'lasso' type design, which consumers may perceive as not working and be tempted to rip off the bottle. It is easier to understand what a hinged closure is trying to achieve, and consumers are less likely to tear off the closure to separate it.

A snap-on hinged closure may provide financial benefits because the closure design provides an opportunity to reduce the height of the bottle finish, which cuts down on the amount of PET needed. Snap-on closures are only suitable for still beverages such as water, but the market is certainly large enough to make potential savings very attractive.

Augustin De Tilly, Global Business Development Director for Aptar's food and beverage division, describes hinged closures as "the future, due to the user experience and cost saving opportunities." De Tilley believes that a finish weight for a hinged closure could be reduced to 1.1g, a significant decrease to the approximately 2.4g weight of a threaded 26mm finish.

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Transition Time

A Burden on Resources

Transitions to new technologies take considerable resources, including time, man-hours and financial resources.

It took a number of years to complete the transition to 1881 closure and finish systems, and that was when the return on capital investment was very attractive. In the case of tethered closures, a positive return on investment isn't guaranteed, reducing their motivation to execute.

The ABA also commented on the transition time in the 2018 article. The State of California was considering a similar regulation at the time, prompting the ABA to disclose their estimation that the time from prototype to full commercialization, just in California, would be 8 to 10 years for major beverage manufacturers. This makes a 2024 deadline for the EU, with its diverse and complicated supply chains, appear to be a significant challenge.

Brand owners and suppliers will also need to reassemble their armies of travelling engineers to manage the qualification requirements for the new technologies. Again, the looming deadline requires brand owners to deploy significant resources. Instead of managing an extended sequential qualification process, they will have to manage many qualifications concurrently, or at least in very quick succession, putting a strain on working resources.

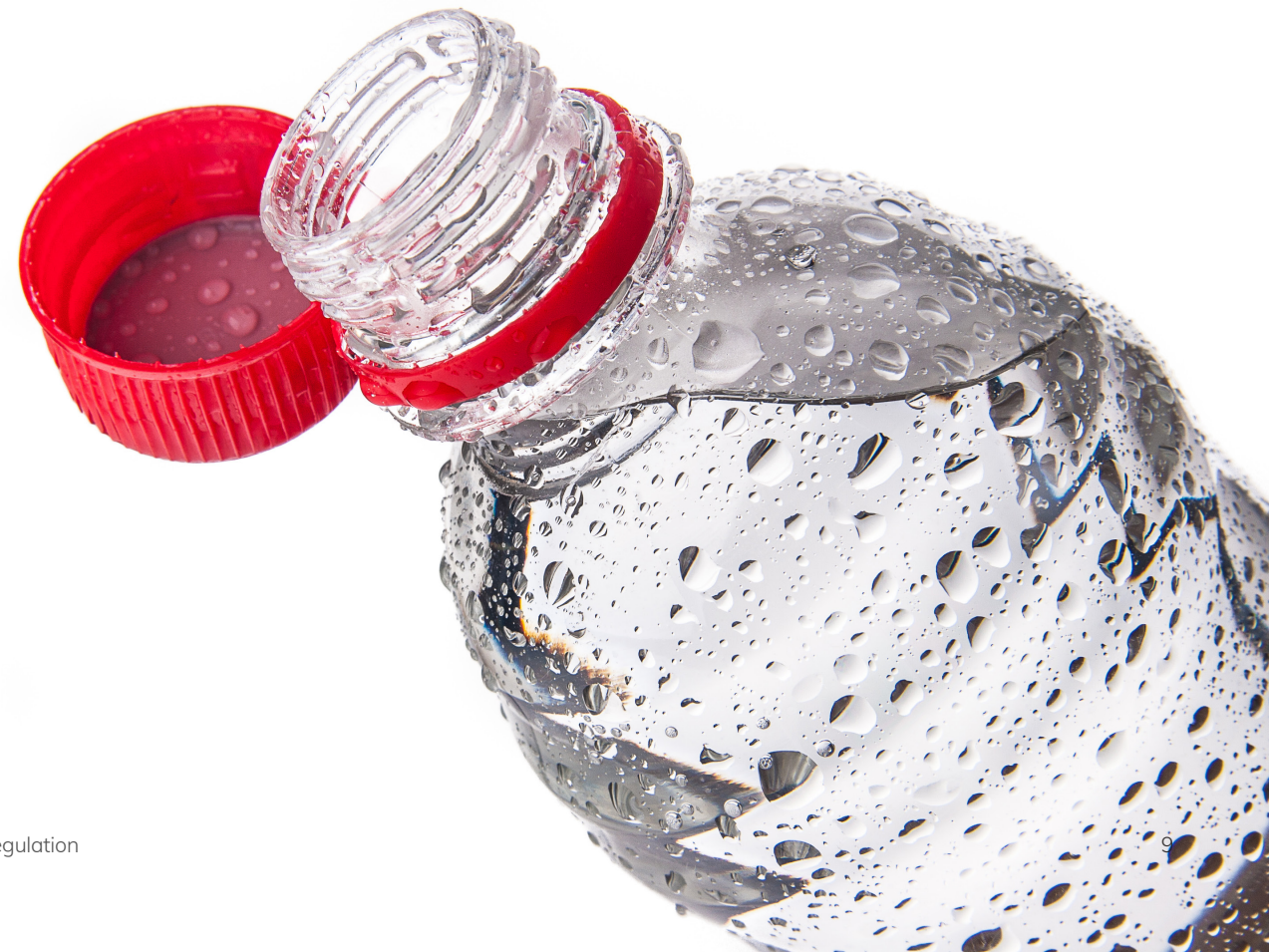
Cost control will be essential during the transition. Project Managers will need to minimize the financial impact by utilizing expertise that recognizes the design risks early in the development process before costly mistakes are made.

The Way Forward

As 2024 quickly approaches, brand owners will need to adhere to the new regulation despite these challenges, not to mention risks of PET recycling stream contamination and potential increases in the use of virgin material.

Organizations need to act now to overcome the obstacles identified in this paper by taking the following action:

- Standardize performance standards for tether strength and opening performance
- Collaborate across the industry, especially for standardization of a reduced weight PET finish for non-carbonated beverages
- Ensure efficient management of qualification programs to meet regulation deadlines and minimize cost
- Design closures with the ability to use food-contact-grade recycled material



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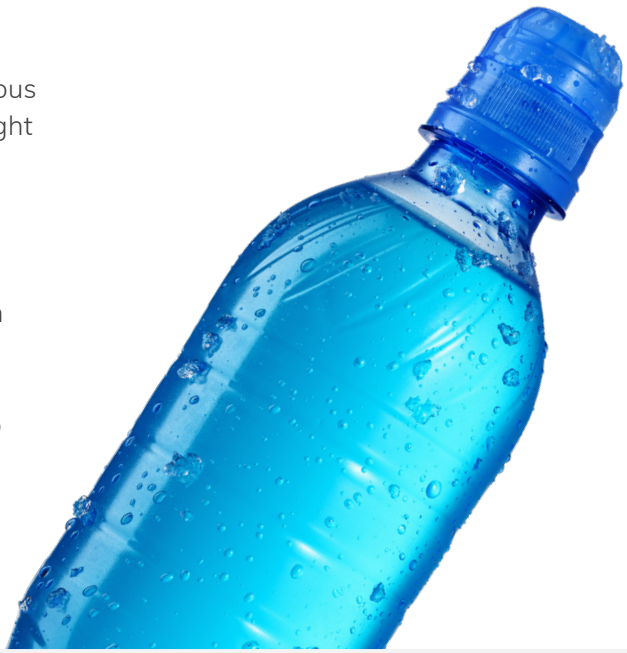
Get in Touch

Partner for Solutions

Partnering with an organization experienced in supporting brand owners through highly complex supply chain initiatives and disruptive regulation implementation has numerous benefits.

At Adept Group, our engineers were responsible for numerous successful qualifications of the 1881 systems and lightweight bottle designs.

Our experts understand the technology that is required to meet these standards and has a depth of experience in innovation within the beverage industry. Beyond solution development, leading food and beverage clients leverage our team of engineers to manage line trials and ensure accurate data collection. Utilizing Adept Group in Europe to ensure adherence to tethered closure regulations will keep organizations compliant and will mitigate internal team disruption and add value to the organization.



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