Tethered Closures

MARK SMITH

SENIOR VICE-PRESIDENT

UNIVERSAL CLOSURES LTD

What is tethering?

Single-Use Plastics Directive

The Directive (EU 2019/904) on the reduction of the impact of certain plastic products on the environment, better known as Single-Use Plastics Directive, or SUPD, was passed in June 2019 and came into force on 3 July 2021.

Article 6 of the SUPD also sets rules for beverage bottles up to a volume of three litres. In order to avoid unintended losses of caps or lids from 3 July 2024 on, it is required to have them attached to the bottle.

So, simply put we have to create a range of closures which remain connected to the finish after opening. The specification for 'remaining connected' or tethered is a break away force no less than 25N.

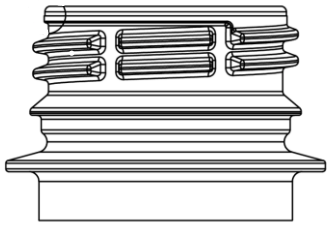
This legislation is applicable only to 'Single-use' products and within the EU region, and yet we are seeing proactive movements by the worlds leading brands to go beyond this.

It is not uncommon to find additional design requirements for tethered closures, that seek to enhance the customers experience.

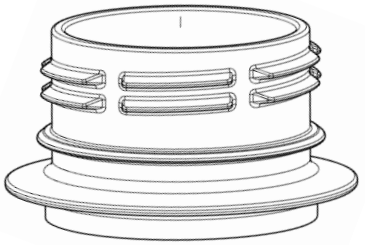
What is all this talk about GME30.40?

- The standard 28mm neck finish PCO1881 is to be superseded by lighter a weight finish GME30.40
- Shorter neck finishes already exist in the form of GME30.37, but testing led by Coca-Cola has shown that this finish in particular does not offer sufficient technical performance in terms of CRT and OPT
- In addition, GME 30.37 lacks the physical space required to accommodate 'net zero' closure tethering technology
- As such the GME30.40 finish was developed by Coca-Cola in conjunction with 7 key suppliers, including UCL
- GME30.40 preserves the internal bore diameter of PCO 1881, but offers a weight reduction of ~1.2g through external design optimisation and material elimination

PCO1881
3.81g



GME30.40
2.61g



Can all closures and finishes be tethered?

In essence yes, but some finishes present more challenges than others.

The aim when tethering a closure should be to achieve a 'net zero' impact on key characteristics such as:

- Weight
- Capping application
- Manufacture
- Tooling design
- Customer interaction

GME30.40 for example could have been made lighter. Specifically by making the overall height shorter, but this would have significantly impacted the design possibilities. Therefore 2mm vertical space was included to accommodate the most effective tethering designs to be fully integrated. .

Existing finishes like GME30.37, 2925, 38mm lack this vertical space, but that doesn't mean they can't be tethered. In these cases, non-integrated 'external' features that protrude beyond the conventional closure parameters can be considered.

However, these designs create other challenges, specifically around tooling design and capper application.

UCL tethered design solutions?

EAGLE

- Screw-top closure design
- Designed for GME30.40
- Works with PCO1881 and others
- Suitable for all beverages; inc CSD
- Meets brand specific requirements
  - Clearance to finish opening
  - Repeatable, intuitive operation
  - Opening self-holdback

Challenges overcome

- Maintained shell integrity for high CSD performance
- Finish clearance before tether articulation
- Capping system and cross closure compatibility

UCL tethered design solutions?

HMC

- Simple flip-top closure design
- No special finish required
- Intended for short neck finishes like 2925
- Suitable for still beverages; water, dairy
- UCL hinge provides integrated tether
- High consumer convenience
- Maximum tool cavitation footprint

Challenges overcome

- Fully functioning on existing threaded finish
- Achieving reseal without compromising opening
- Capping system compatibility and chuck design

Beyond tethering?

Tethering is just one way in which the plastics packaging industry can move towards reducing its environmental impact.

To make the significant change that is required, an holistic approach on multiple fronts will be needed. Other areas of innovation include:

- Closure design from singular resin type to simplify recycling
- Move away from virgin resin – incorporate PCR resins like EcoPrime
- More reusable packaging – RefPET bottle system
- Explore bio resins and bio-assimilation additives
- Improve education and refuge infrastructure where most needed

ENVISION PLASTICS

www.universalclosures.com