



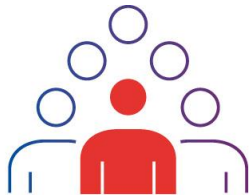
Tethered caps - industry challenge & solutions

Andreas Brem, June 23, 2020

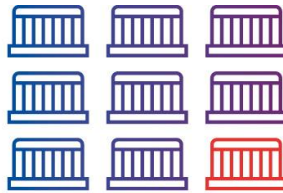
BERICAP - At A Glance



BERICAP - At A Glance



3.650
Employees worldwide



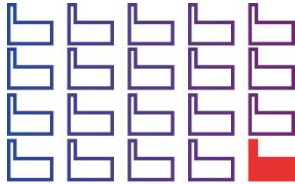
86 bln.
Closures produced



5
Continents



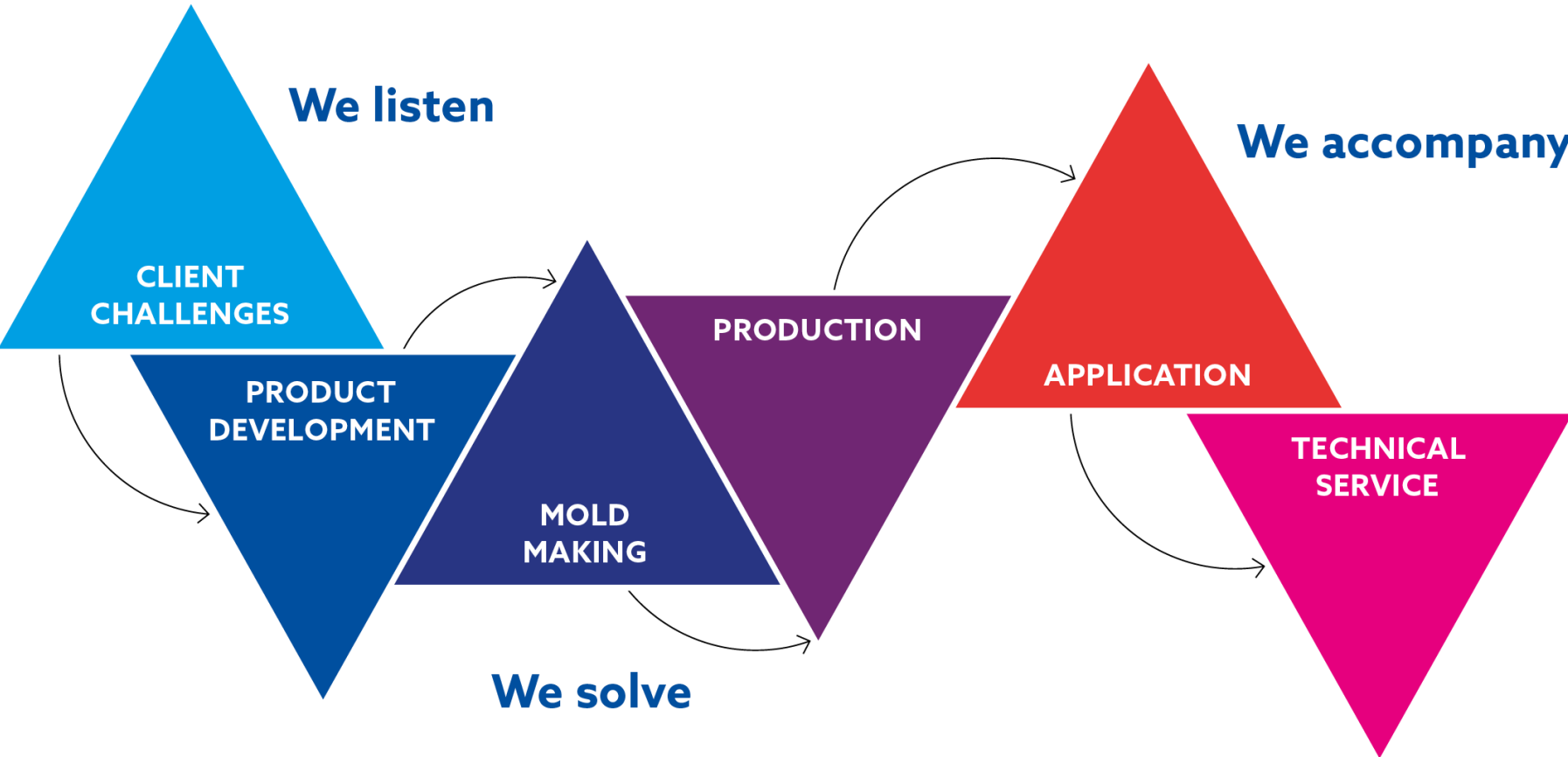
100
Countries



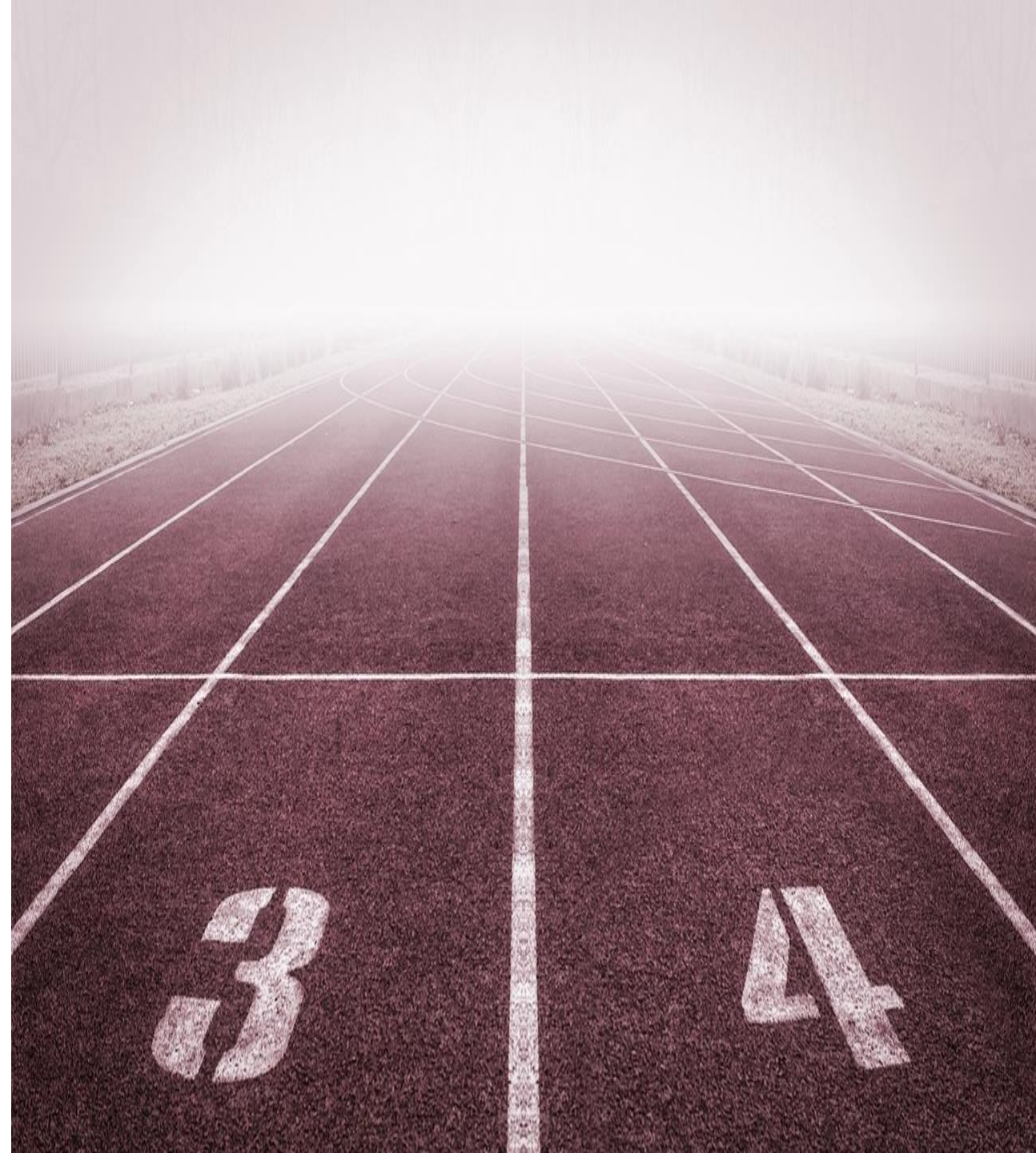
24
Production Sites

*All figures based on 2019

BERICAP – Your Process Companion



Tethered Caps - The Industry Challenge



Tethered Caps - The Industry Challenge

EU Single Use Plastics Directive and its Implications

The EU Single Use Plastics (SUP) Directive came into force July 2nd, 2019 with a tight execution timeline

2019	2020 -2024	2024
July 2019 Publication SUP Directive	<ul style="list-style-type: none">- Technical specifications for tethered caps until Dec 2022- Ratification into national laws- Amendment of certification standards and processes- ... <ul style="list-style-type: none">- Closure developments based on defined specifications- Pilot tools, testing, approvals- Equipment development / manufacturing- Technical & consumer tests,- Production tools- Line Trials, evaluation, approvals- ...	July 2024 Market Introduction

Tethered Caps - The Industry Challenge

EU Single Use Plastics Directive and its Technical Requirements

The CEN Standardization draft (not yet official) is focusing on the following technical specification:

1. Tear-off resistance:

- Containers with integrated neck finishes (e.g. PET single use bottles)
Tear-off resistance minimum 25N in vertical and horizontal direction
- Containers with neck finishes not integral with the container body (e.g. beverage carton and pouches)
Tear-off resistance minimum 12N in vertical and horizontal direction

2. Reliability:

Opening and reclosing minimum 15 times without breaking of tether, time lag undefined

3. Safety:

Closure to pass all established beverage packaging performance tests

Tethered Caps - The Industry Challenge

Relevant Product Categories



Press-on or screw cap

- ▷ Still water
 - Press-on hinge cap feasible in case of low tightness requirement
 - **For premium: screw cap**
 - Low tightness
 - Increased body weight



- ▷ Still water N₂ flushed
 - Screw cap for tightness against N₂ loss even with neck damages
 - Ensures bottle stability



Screw cap required

- ▷ Aseptically filled bev.
 - Screw cap for tightness against ingress of germs
 - Sealing neck damages
 - Safe venting in case of product fermentation



- ▷ Carbonated beverages
 - Screw cap for safe venting of inside pressure
 - Sealing neck damages

Tethered Caps – BERICAP Solutions



Tethered Caps – BERICAP Solutions

▶ Hinged tether options for screw caps



SwingAside



ClipAside



HingeAside



ClipUnder
Under dvlpmt

▶ Tether options for screw caps w/o hinge



SwingDown



SwingOver



ClipIn

▶ SnapOn solutions



SnapCap



Thor

Tethered Caps - Product Range Video



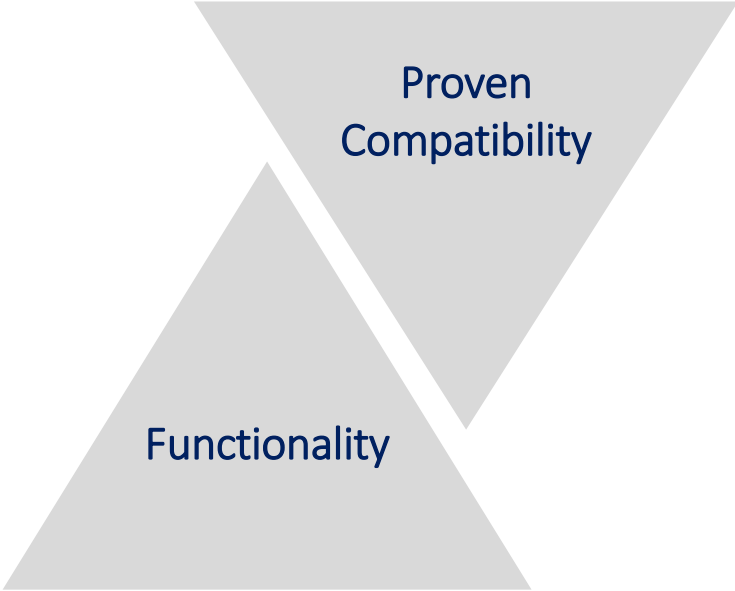
Click for watching



Tethered Caps – Features & Benefits



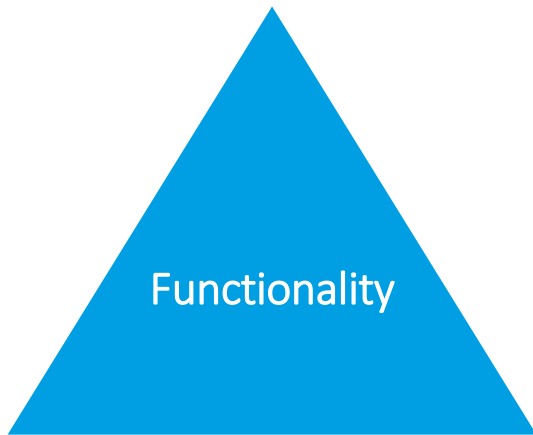
Tethered Caps – Features & Benefits



Tethered Caps – Features & Benefits

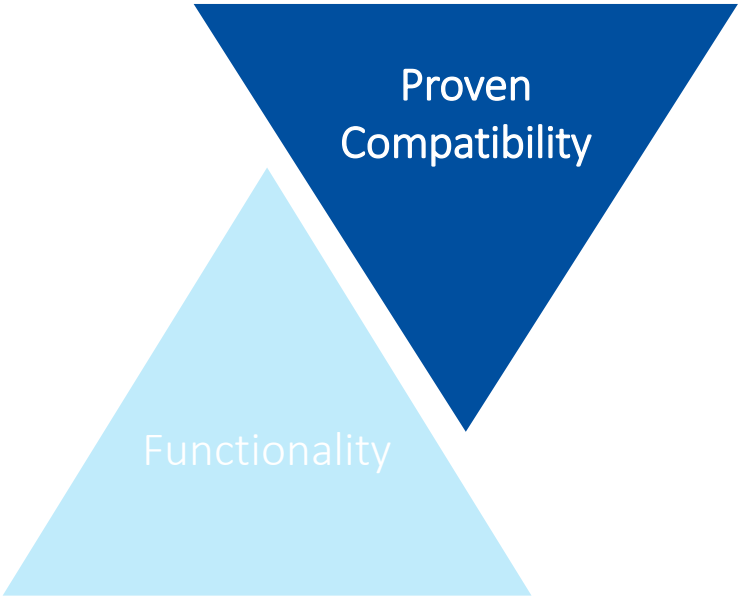


Tethered Caps – Features & Benefits



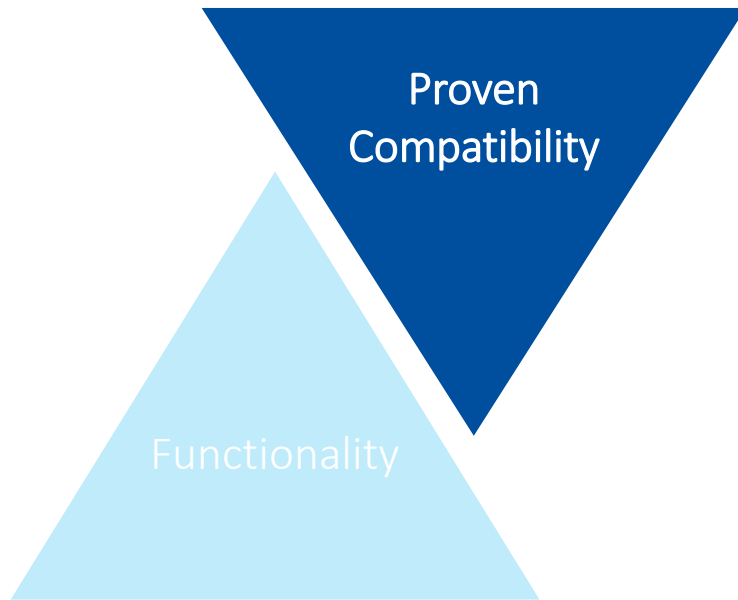
- ▶ Intuitive opening and closing
- ▶ Affirmed, defined open position
- ▶ Wide opening angle for
 - Hazzle-free drinking
 - Splash-free pouring
- ▶ Fit for CEN Regulations
 - min 25N tear-off resistance in vertical and horizontal direction
 - minimum 15 opening and reclosing without tether breaking

Tethered Caps – Features & Benefits



Tethered Caps – Features & Benefits

- ▶ Proven compatibility with all major neck finishes
- ▶ Availability of samples for line trials of all relevant neck finishes



PET 26/1T
Under development



PET 26/3T



PCO 1881



PET 29/25



PET 30/25

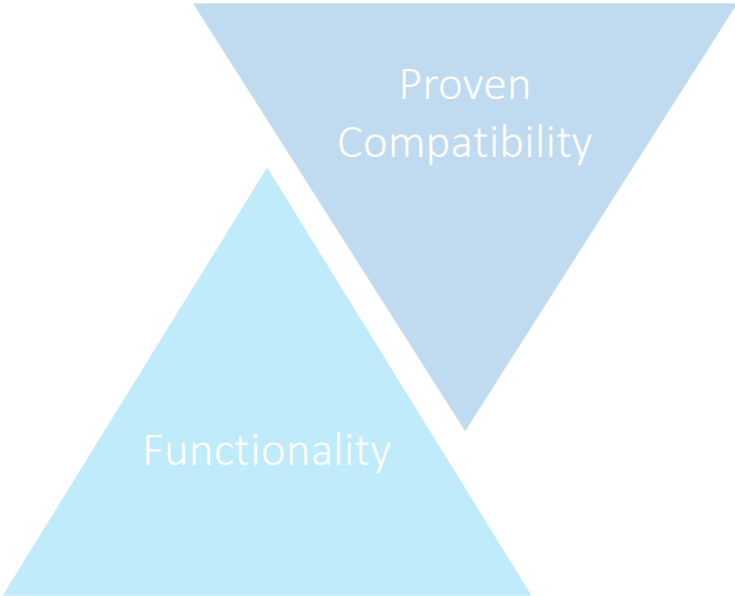


PET 33 2T



PET 38 2T/3T

Tethered Caps – Features & Benefits



Tethered Caps – Features & Benefits

▶ For Bottlers

- No change to neck
- No change to filling equipment
- No change to capper, only adjustment of chuck

▶ For Converters

- Use of existing production equipment
 - As little as possible modification to the existing equipment
- Thanks to external slitting of the TE-bands high output per sqm

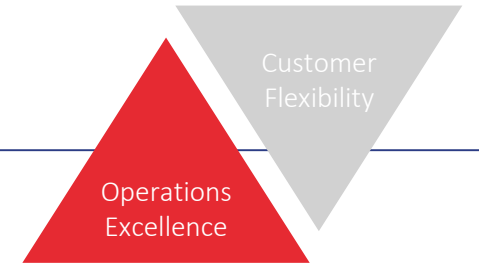
▶ BERICAP in-house mold maker

- Tethered cap features will lead to massive mold replacements
 - BERICAP mold building capacity has been built up to be prepared for the expected tool capacity bottle neck of the market



Tethered Caps – Features & Benefits

Tethered cap solutions with slit-flex bands, application on lab capper



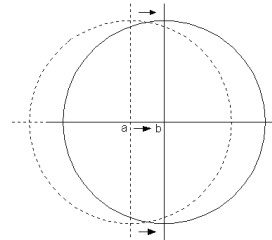
- ▶ 1mm off-center or tilted closure is application reality - Slit flexbands have proven to cope with this reality

Closure in chuck



- No broken bridges
- No swallowed TE band
- No cocked cap

Closure in chuck neck 1mm off-center



- No broken bridges
- No swallowed TE band
- No cocked cap

Closure tilted on neck



- No broken bridges
- No swallowed TE band
- No cocked cap

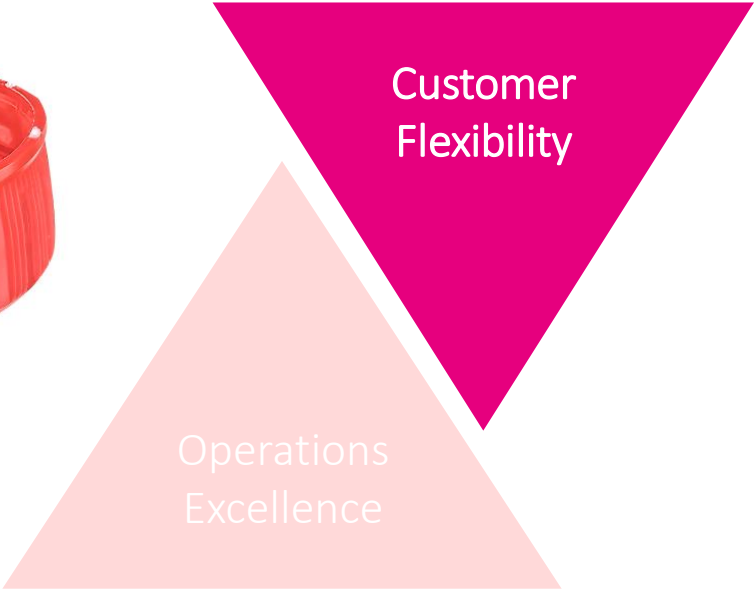
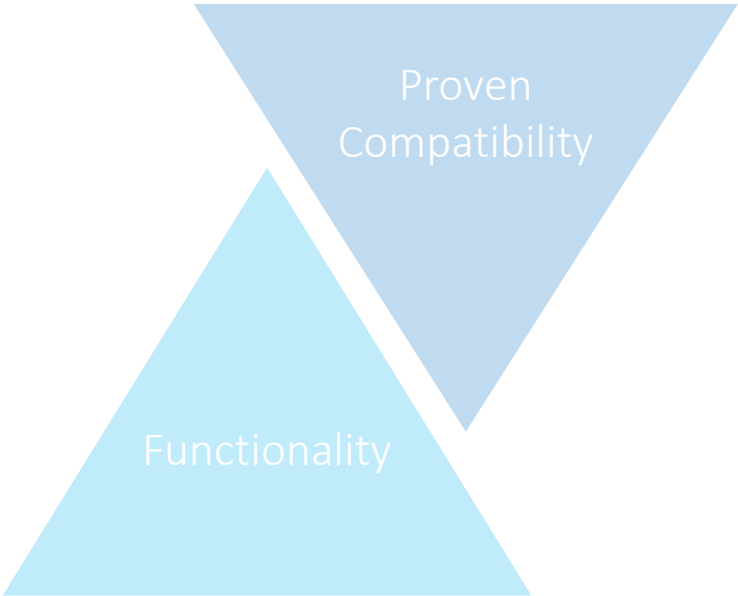
Cocked cap



Swallowed TE-band

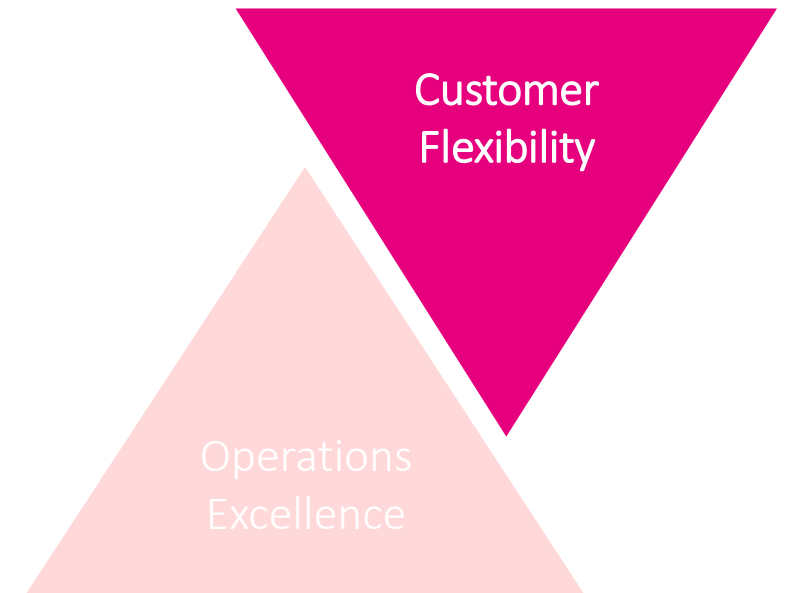


Tethered Caps – Features & Benefits

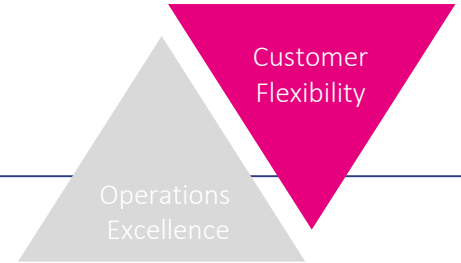







Tethered Caps – Features & Benefits

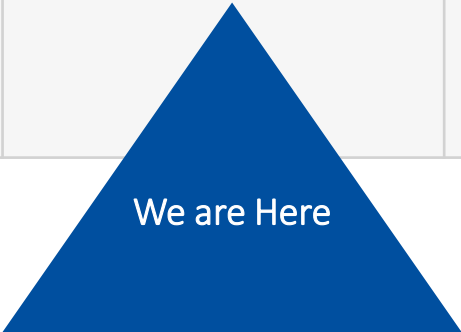
- ▶ Tested and approved set of product solutions to meet
 - CEN regulation specifications
 - Consumer acceptance
 - Production and filling process requirements
- ▶ Availability of samples for
 - Consumer testing on customer product
 - Filling line trials
- ▶ Support with potentially necessary filling line modifications
- ▶ Synchronisation with market introduction preparation (e.g. Marketing & Communications)



Next steps – Execution Timeline



2020	2020/2021 Closure Approval	2021 Market test	2021-2023 Introduction of a new design	2020-2024 Conversion to tethered
 <p data-bbox="224 768 491 801">Current situation</p>	 <p data-bbox="644 775 927 905">Approval of closure design w/ tethered option</p>	 <p data-bbox="1077 775 1360 905">Market test with different tethered versions</p>	 <p data-bbox="1500 772 1854 993">Conversion of filling lines to closure design with tethered option BUT with TE band as known nowadays</p>	 <p data-bbox="1921 768 2295 1039">Conversion to tethered closure whenever marketing/production/ distribution is prepared for market introduction of tethered cap</p>



Introduction of new cap design and tethered cap dislinked allows early preparation of closure production



We are ready to support your line trials now.

@: tetheredcaps@bericap.com