



THE (NEXT) SUSTAINABLE NORMAL IN BEVERAGE PACKAGING

design, materials, technologies

Presentation by
SACMI RIGID PACKAGING TECHNOLOGIES
March 2022



SACMI VALUES, MISSION AND VISION

THE ENVIRONMENTAL CHALLENGE

REDUCE

Lightweighting in caps and preforms - 26/22mm
Energy Saving

REUSE

Returnable Bottles

RECYCLE

Post-consumer recycled polyolefins and R-Pet
Tethered Caps



SACMI VALUES, MISSION AND VISION



WE DON'T SELL MACHINES, WE GENERATE TRUST

SAFRIPOL SUSTAINABILITY CONFERENCE 2022



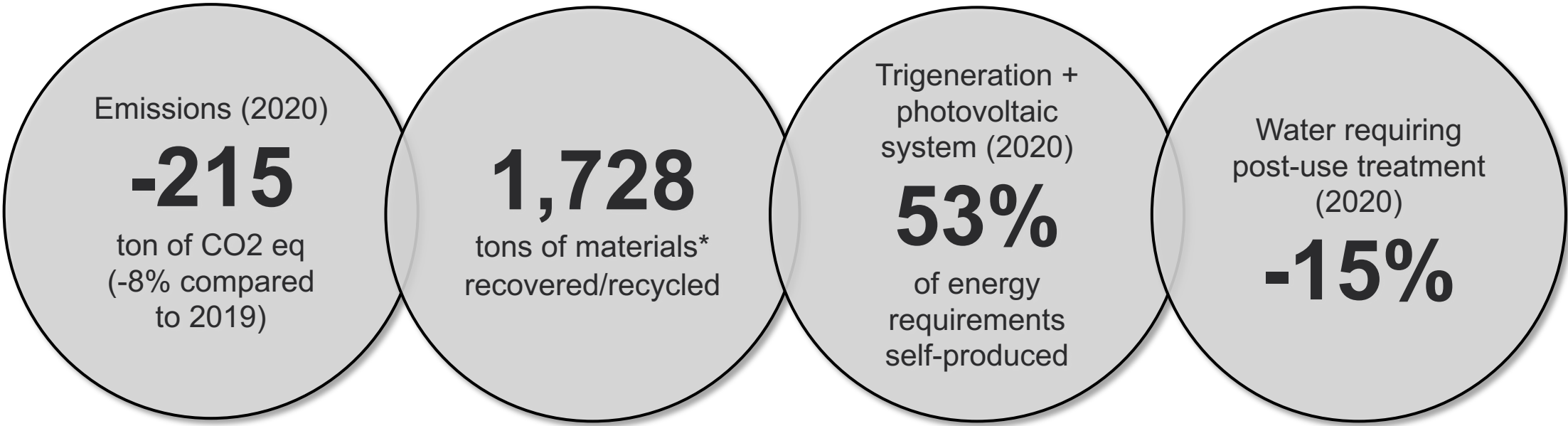


WE ARE WHERE YOU ARE





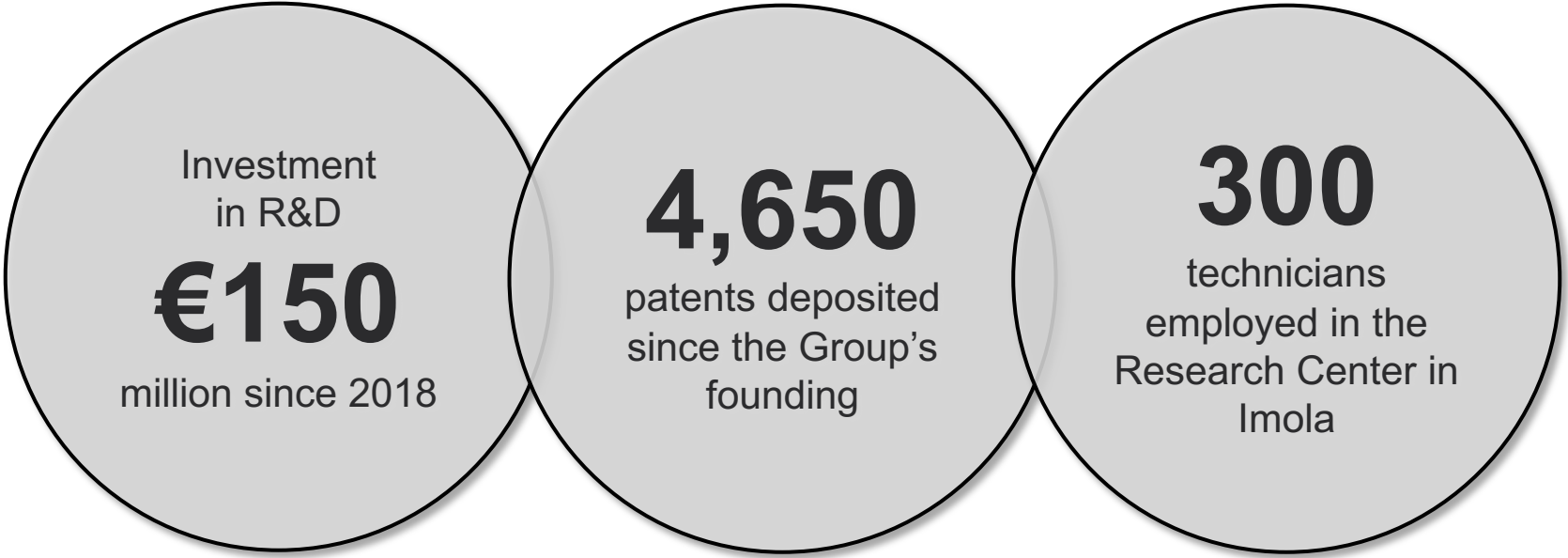
ENVIRONMENTAL PERFORMANCE



* Iron, plastic, wood, paper, cardboard, various waste materials



RESEARCH AND INNOVATION





RIGID PACKAGING TECHNOLOGIES

SACMI DEVELOPS MULTI-PLATFORM, MULTI-MATERIAL PACKAGING SOLUTIONS TO MEET THE NEEDS OF WATER AND OTHER LIQUID PRODUCERS ALL OVER THE GLOBE, DEVELOPING COUNTRIES INCLUDED.





THE ENVIRONMENTAL CHALLENGE



PLASTIC OPTIMIZATION IS A KEY ISSUE



For nature



For ocean biodiversity

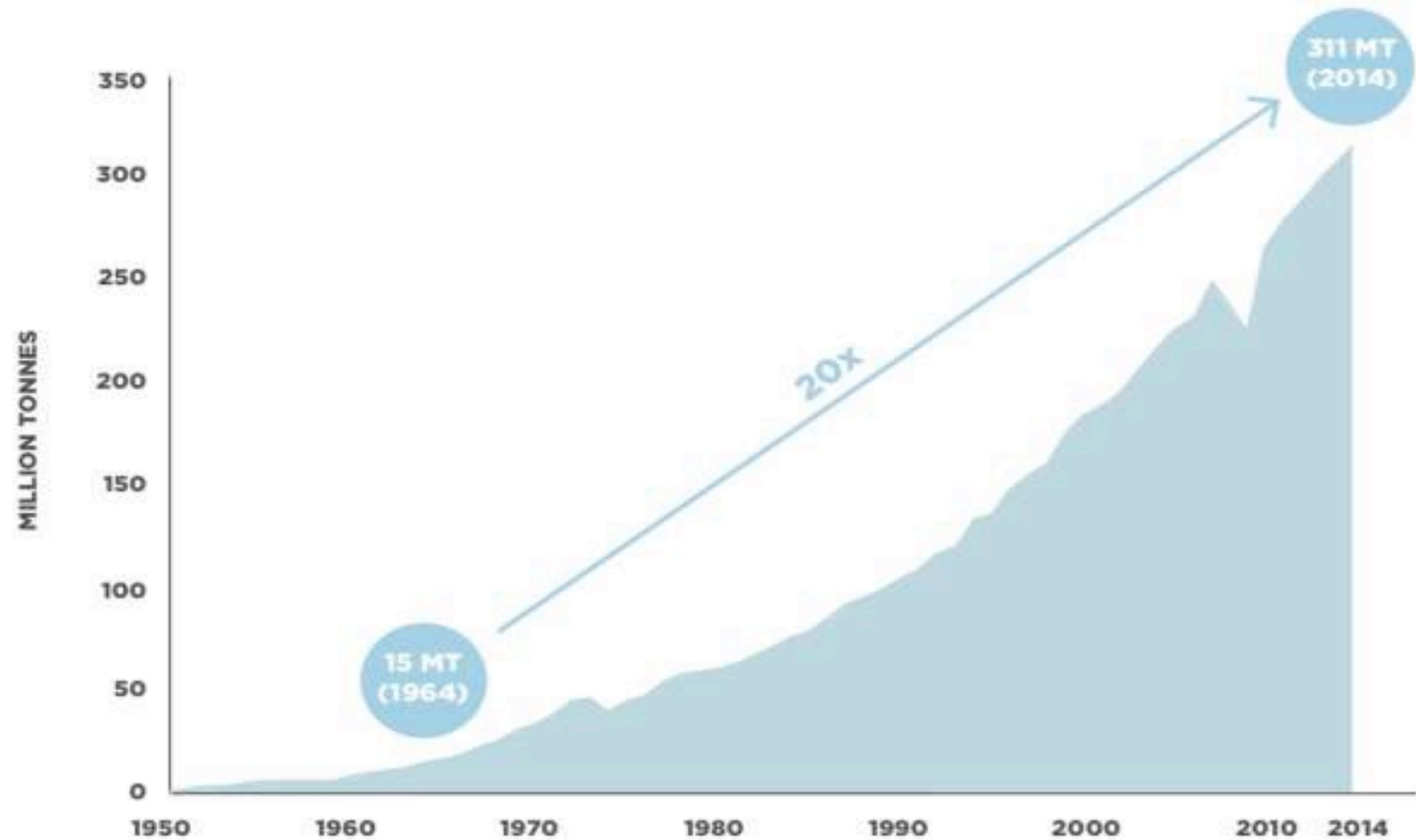


For the atmosphere



PLASTIC OPTIMIZATION IS A KEY ISSUE

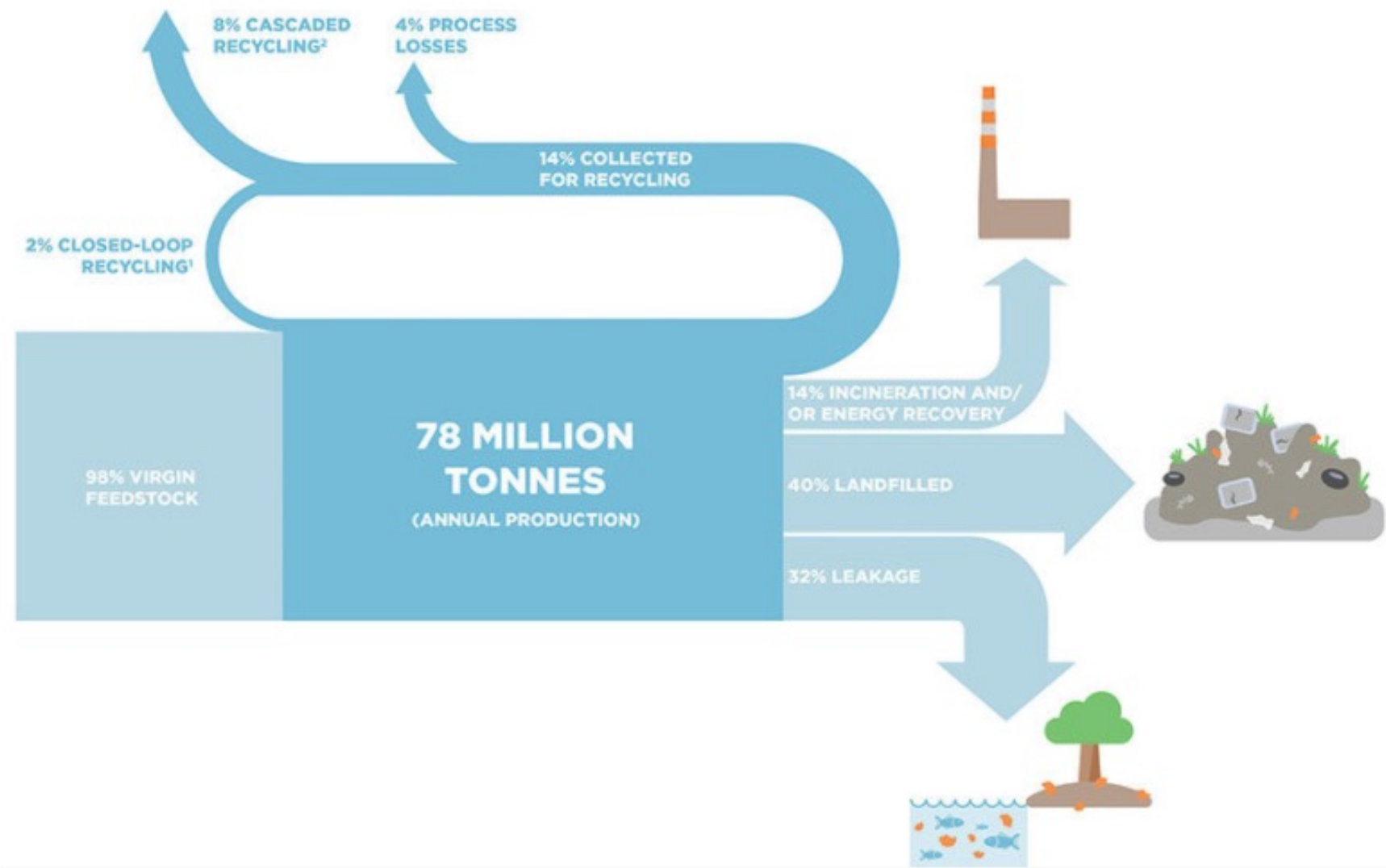
Figure 1: Growth in Global Plastics Production 1950–2014



Note: Production from virgin petroleum-based feedstock only (does not include bio-based, greenhouse gas-based or recycled feedstock)
Source: PlasticsEurope, Plastics – the Facts 2013 (2013); PlasticsEurope, Plastics – the Facts 2015 (2015).

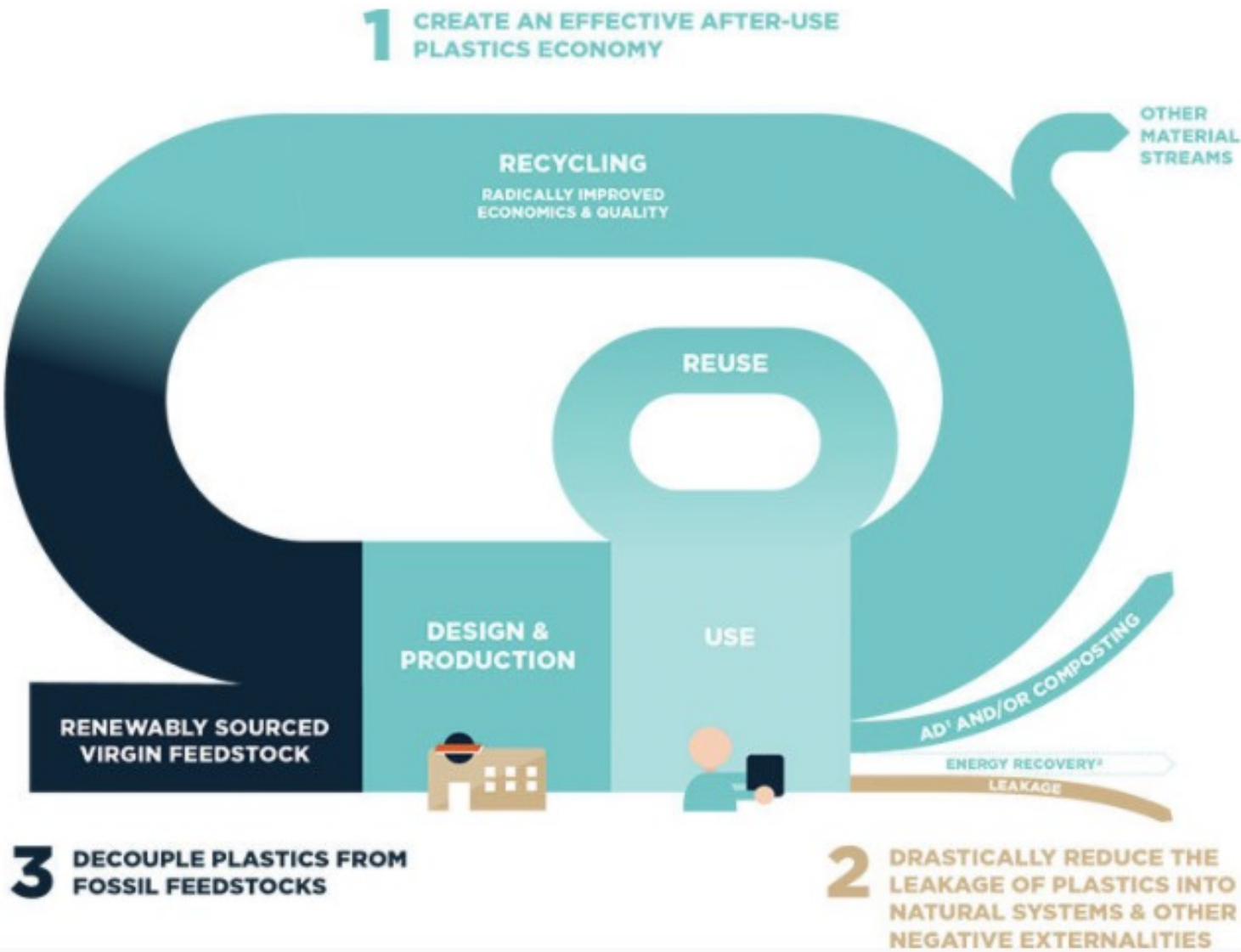


FROM LINEAR TO CIRCULAR PLASTIC ECONOMY





FROM LINEAR TO CIRCULAR PLASTIC ECONOMY



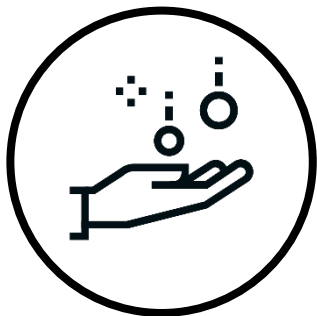


REDUCE

Lightweighting in caps and preforms - 26/22mm
Energy Saving



LIGHTWEIGHTING IN CAPS AND PREFORMS



To optimize resources



To reduce energy for production

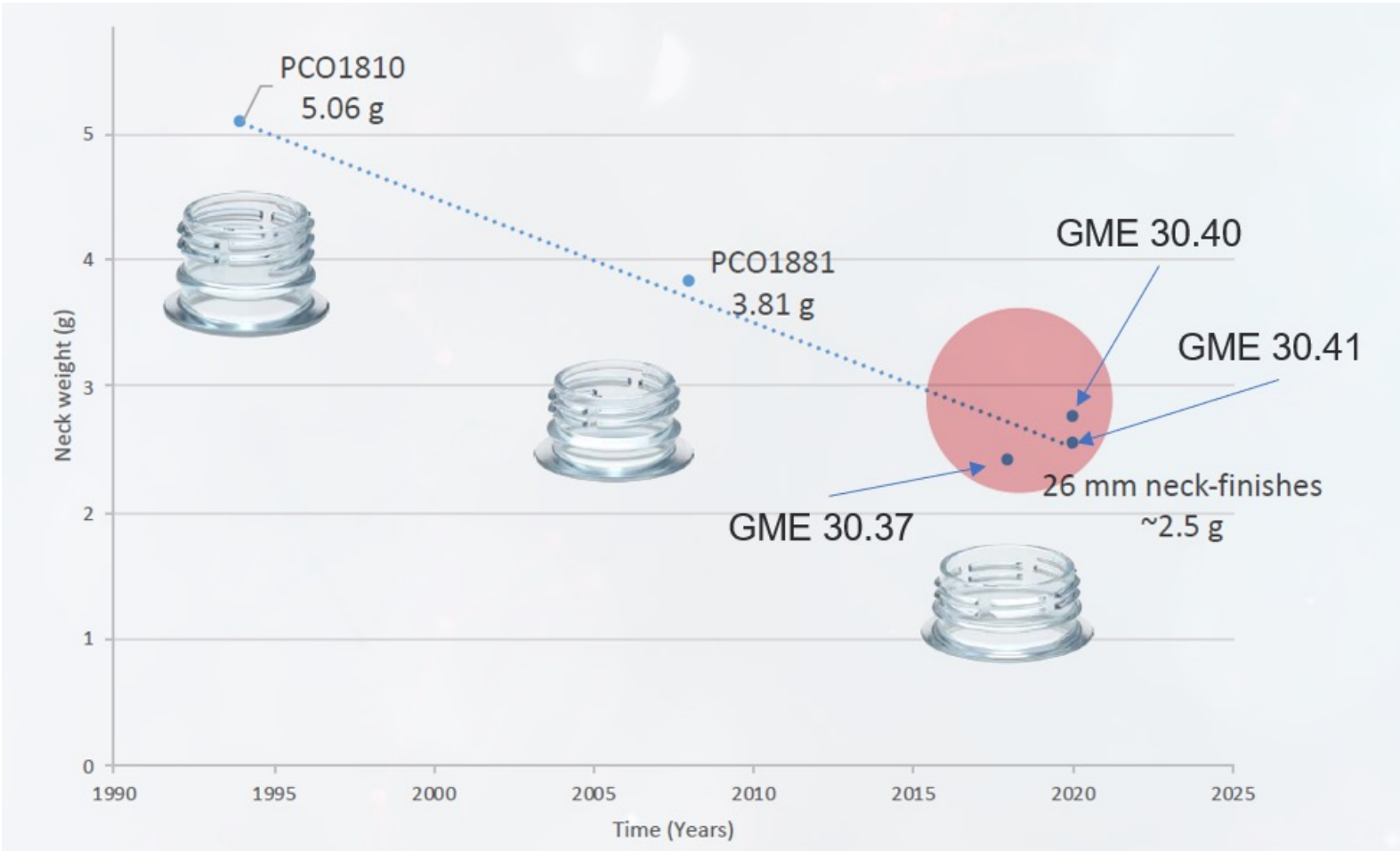


To reduce energy for transportation



LIGHTWEIGHTING IN CAPS AND PREFORMS

NECK EVOLUTION

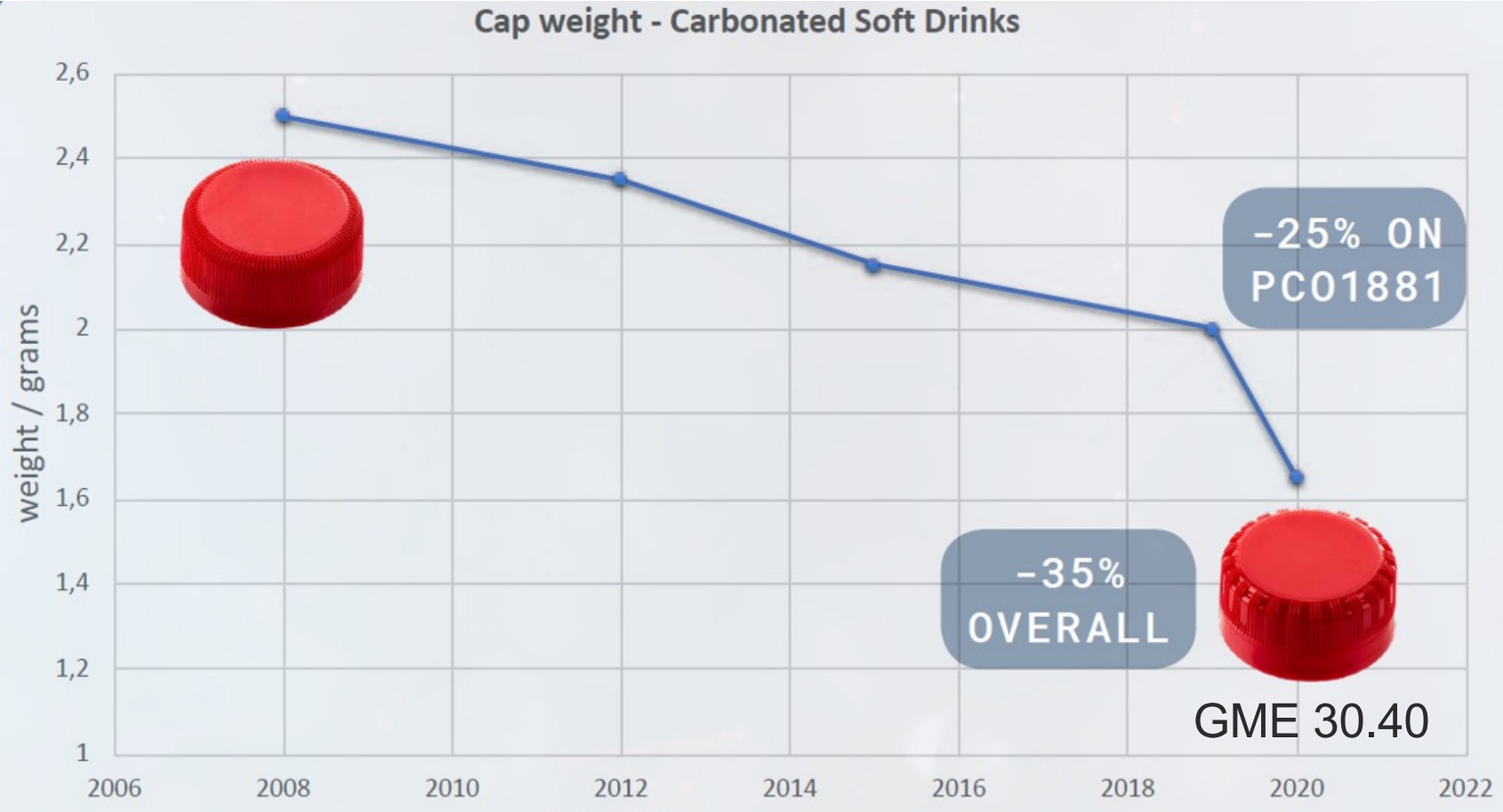


50% weight reduction
in last 25 years



LIGHTWEIGHTING IN CAPS AND PREFORMS

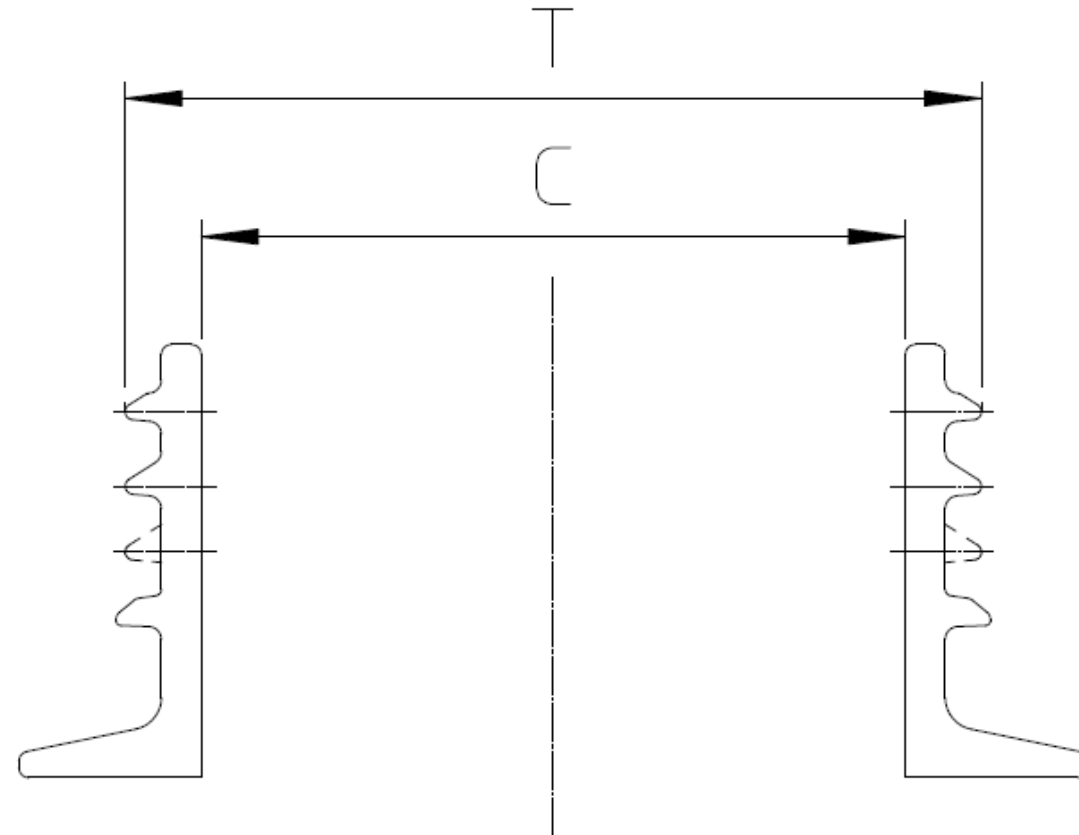
CLOSURE EVOLUTION



LIGHTWEIGHTING IN CAPS AND PREFORMS

26/22 NECKFINISH – GENERAL CONSIDERATIONS

- 26/22 mm means that:
 - T diameter is about 26 mm
 - C diameter is about 22 mm
- There are many different types, unlike other neck finish sizes.
- The properties of the neck can change dramatically and have completely different fields of applications.
- Every project must always start from a confirmed neck drawing.





LIGHTWEIGHTING IN CAPS AND PREFORMS

26 / 22 NECKFINISH – WHY SO MANY?

- Usually, the 26/22 mm necks are lighter and shorter than other necks (PCO1881, 30/25 mm)
- In a smaller space, it is more difficult to accommodate all neck features required to cope with requirements for all type of beverages
- Different needs, different solutions. Some approaches tend to favor weight savings, others lean towards performance.
- One cap fits one neck only, therefore make no mistakes.



LIGHTWEIGHTING IN CAPS AND PREFORMS

26 / 22 NECKFINISH – WHY SO MANY?

Three threads neck finishes

- Strictly still water only (also Nitrogen pressurized water)
- One standardized neck GME30.28
- Multiple customized neck finish, more than 20

Single thread neck finishes

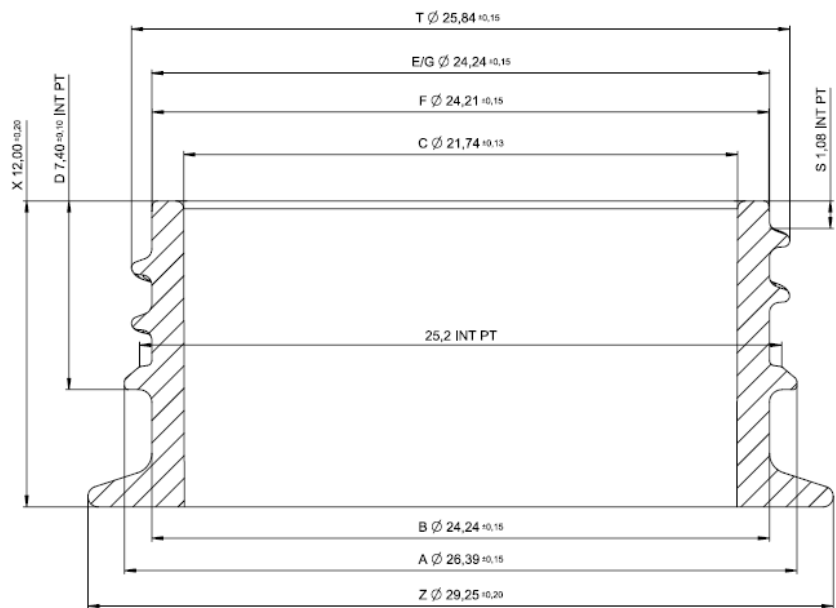
- Also used for carbonated beverages
- There are multiple standardized neck finishes
 - GME30.37
 - GME30.38
 - GME30.40
 - GME30.41



LIGHTWEIGHTING IN CAPS AND PREFORMS

26/22 NECKFINISH – STILL WATER

GME30.28	Only still water	2,0 liters	1,95 g	NSR 29,25 mm
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LEAD = 6,5 mm
THREAD RUN-IN = 6,25 mm
THREAD RUN-OUT = 6,25 mm

RIGHT HAND THREAD
3 START, 120° APART
180° FULL THREAD PER LEAD

Markets

Italy: main neck for still water
USA: together with other necks
Germany: Hard Discount

LIGHTWEIGHTING IN CAPS AND PREFORMS

26 / 22 NECKFINISH – CSD

Single threads neck finishes

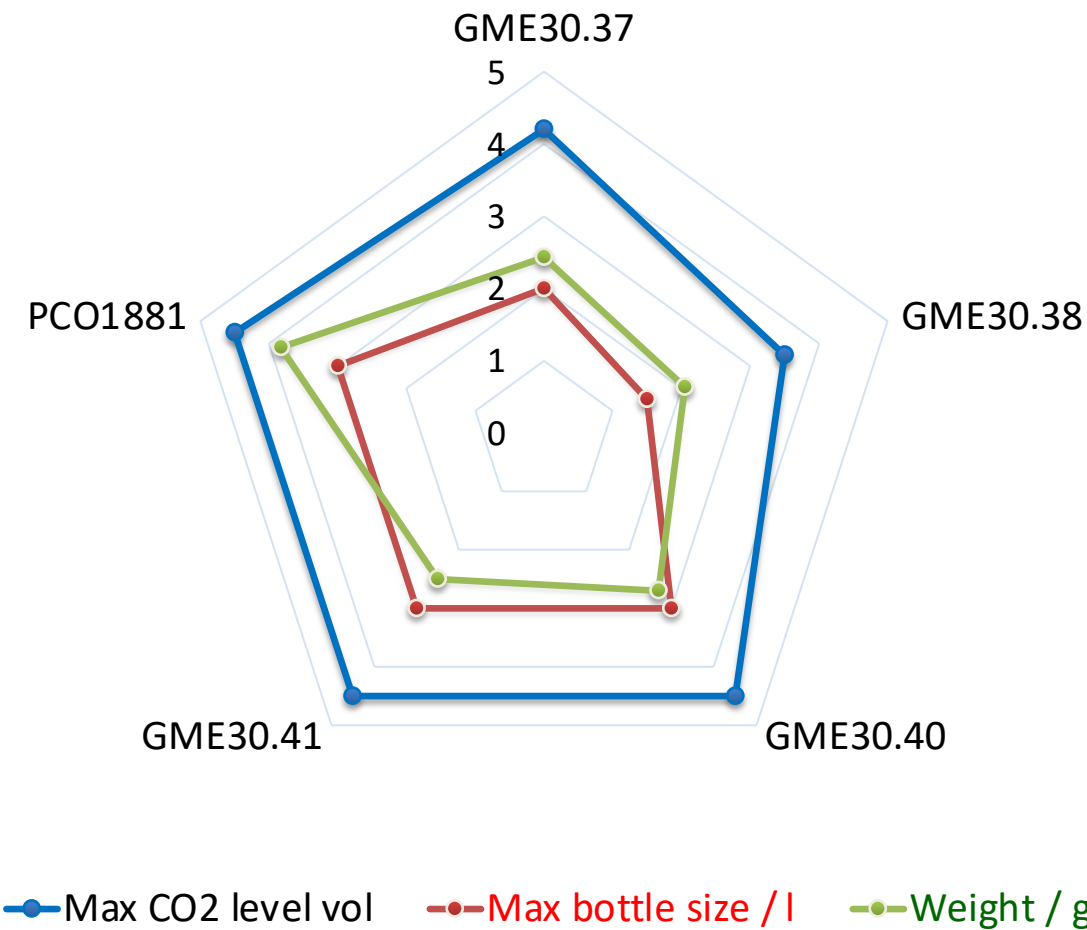
- Depending on the neck type, for beverages up to 5,2 vol of CO2
- Caps fit a single neck only, not multiple neck finishes. Therefore, always start a project with a confirmed neck finish.

Name	Max CO2 level	Max bottle size	Weight	Remarks
GME30.37	8,4 g/l – 4,2 vol	2,0 liters	2,43 g	NSR 31 mm
GME30.38	7,0 g/l – 3,5 vol	1,5 liters	2,05 g	NSR 29,25 mm
GME30.40	8,8 g/l – 4,5 vol 10,2 g/l – 5,2 vol	3,0 liters 2,0 liters	2,70 g	NSR 33 mm (easily tetherable)
GME30.41	8,8 g/l – 4,5 vol 10,2 g/l – 5,2 vol	3,0 liters 2,0 liters	2,50 g	NSR 33 mm
PCO1881	8,8 g/l – 4,5 vol 10,2 g/l – 5,2 vol	3,0 liters 2,0 liters	3,83 g	NSR 33 mm



LIGHTWEIGHTING IN CAPS AND PREFORMS

NECK FEATURES COMPARISON

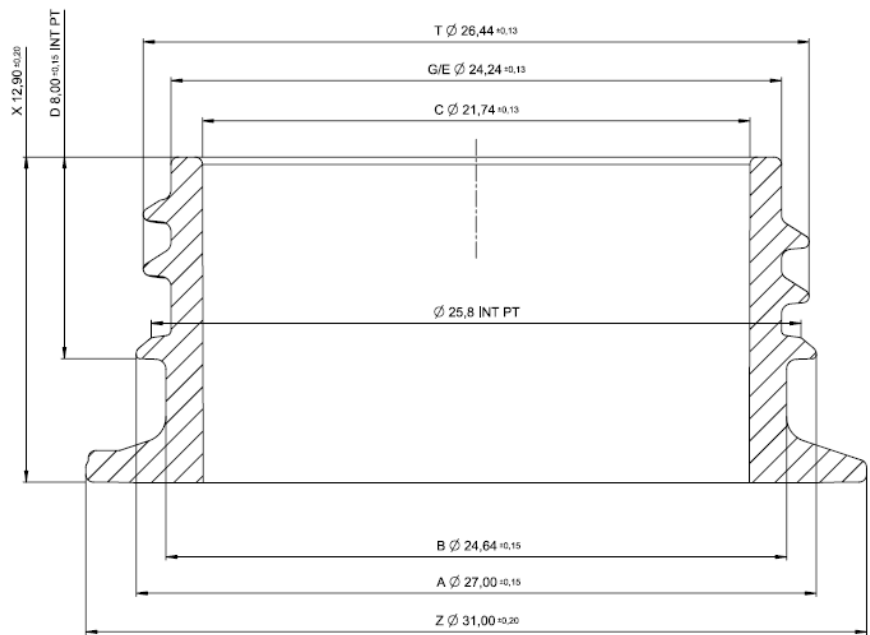




LIGHTWEIGHTING IN CAPS AND PREFORMS

26/22 NECKFINISH – CSD – GME30.37

GME30.37	8,4 g/l – 4,2* vol	2,0 liters	2,43 g	NSR 31 mm
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PITCH = 2,17
THREAD RUN-IN = 6,5 mm

RIGHT HAND THREAD
SINGLE START
678° OF FULL THREAD

Markets

Europe: used in Central and Eastern Europe

Latin America: occasional use

Africa: occasional use

India: occasional use

*cap/neck tested in Sacmi up to 5.2 vol of CO2 with positive results



LIGHTWEIGHTING IN CAPS AND PREFORMS

26/22 NECKFINISH – CSD – GME30.37 – SACMI PROPOSAL



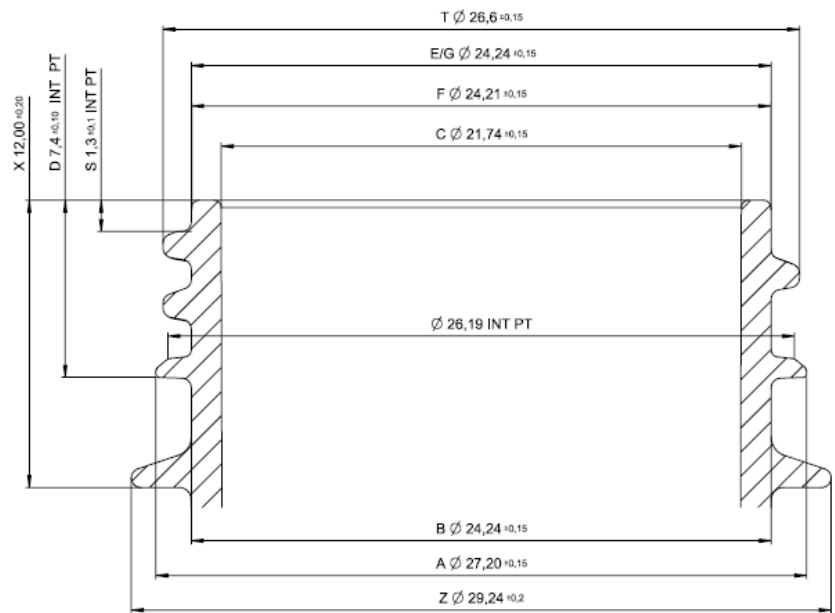
Already in the market



LIGHTWEIGHTING IN CAPS AND PREFORMS

26 / 22 NECKFINISH – CSD – GME30.38

GME30.38	7,0 g/l – 3,5 vol	1,5 liters	2,05 g	NSR 29,25 mm
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PITCH = 2,50
THREAD RUN-IN = 6,5 mm

RIGHT HAND THREAD
SINGLE START
505° OF FULL THREAD

Markets

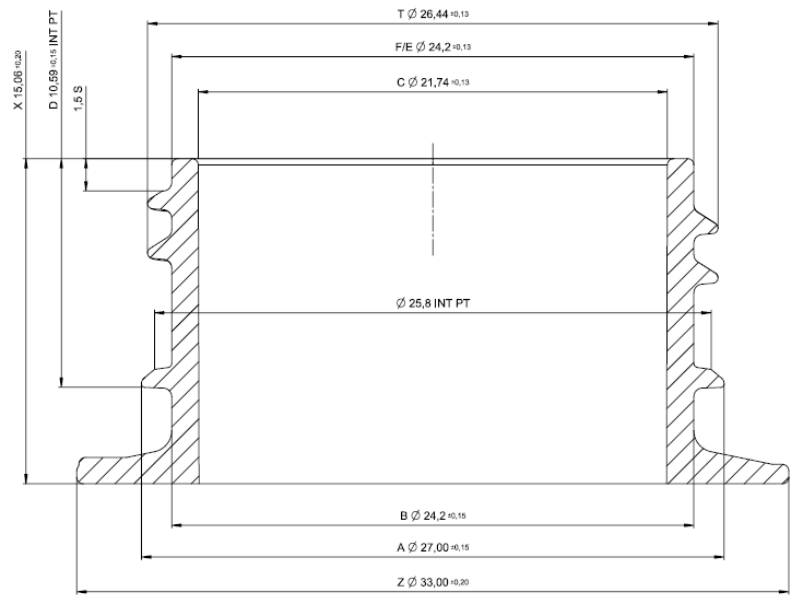
Italy: main neck for still and sparkling water
East Europe: occasional use



LIGHTWEIGHTING IN CAPS AND PREFORMS

26/22 NECKFINISH – CSD – GME30.40

GME30.40	8,8 g/l – 4,5 vol 10,2 g/l – 5,2 vol	3,0 liters 2,0 liters	2,70 g	NSR 33 mm
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GME 30.40 - Z33.00mm
2.70 g
GME 30.40 - Z31.50mm
2.61 g
GME 30.40 - Z30.20mm
2.53 g

PITCH = 2.30
THREAD RUN-IN = 6,5 mm
RIGHT HAND THREAD
SINGLE START
678° OF FULL THREAD

Markets
Europe: just launched
Latin America: planned
Africa: planned



LIGHTWEIGHTING IN CAPS AND PREFORMS

26/22 NECKFINISH – CSD – GME30.40 – SACMI PROPOSAL



Taller neck and taller closure for tethered applications

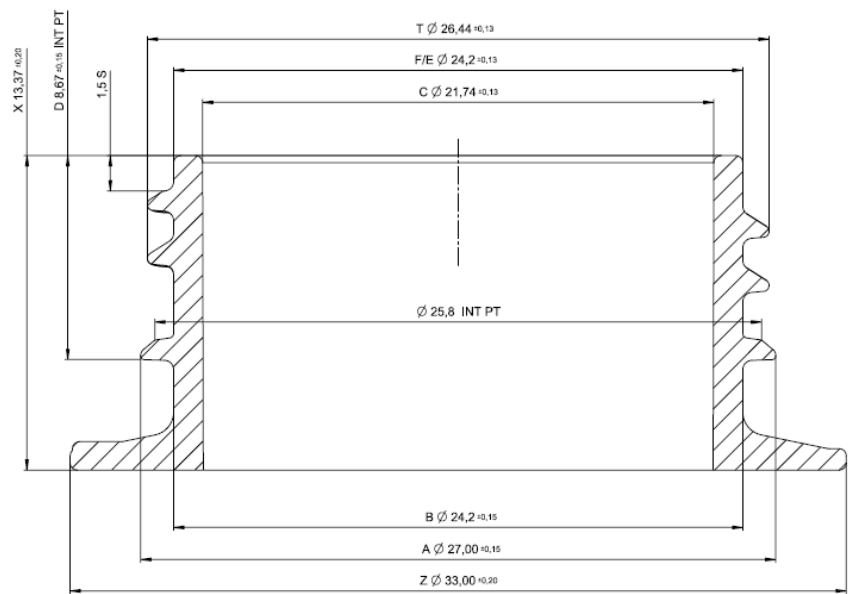
For hot climate and high carbonation may require a slightly thicker top panel (1,8g)



LIGHTWEIGHTING IN CAPS AND PREFORMS

26/22 NECKFINISH – CSD – GME30.41

GME30.41	8,8 g/l – 4,5 vol 10,2 g/l – 5,2 vol	3,0 liters 2,0 liters	2,50 g	NSR 33 mm
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GME 30.41 - Z33.00mm
2.50 g
GME 30.41 - Z31.50mm
2.41 g
GME 30.41 - Z30.20mm
2.33 g

PITCH = 2.30
THREAD RUN-IN = 6.5 mm
RIGHT HAND THREAD
SINGLE START
678° OF FULL THREAD

Markets
Under consideration



LIGHTWEIGHTING IN CAPS AND PREFORMS

26/22 NECKFINISH – CSD – GME30.41 – SACMI PROPOSAL

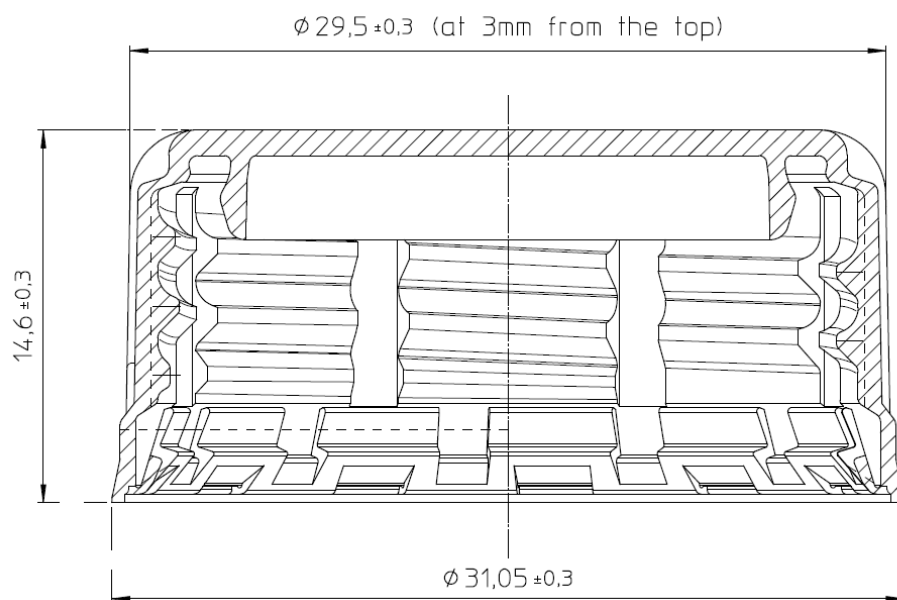


Non-tethered applications

For hot climate and high carbonation may require a slightly thick top panel (1,75g)

LIGHTWEIGHTING IN CAPS AND PREFORMS

1881 NECKFINISH – CSD – SACMI PROPOSAL



- Industrially produced
- Weight from 1.8 g to 2.0 g
- Moulds available with COOL+ technology **only**, Cycle time 2.1 s
- One mold, multi purpose cap

	CSD	**CSD	*CSD
Weight	2.0 g	2.15 g	1.8 g
Thickness	1 mm	1.2 mm	0.75 mm
M OPT 3 I	Passed	Exp. to pass	Passed
Slip agent	1000 ppm	1000 ppm	1000 ppm

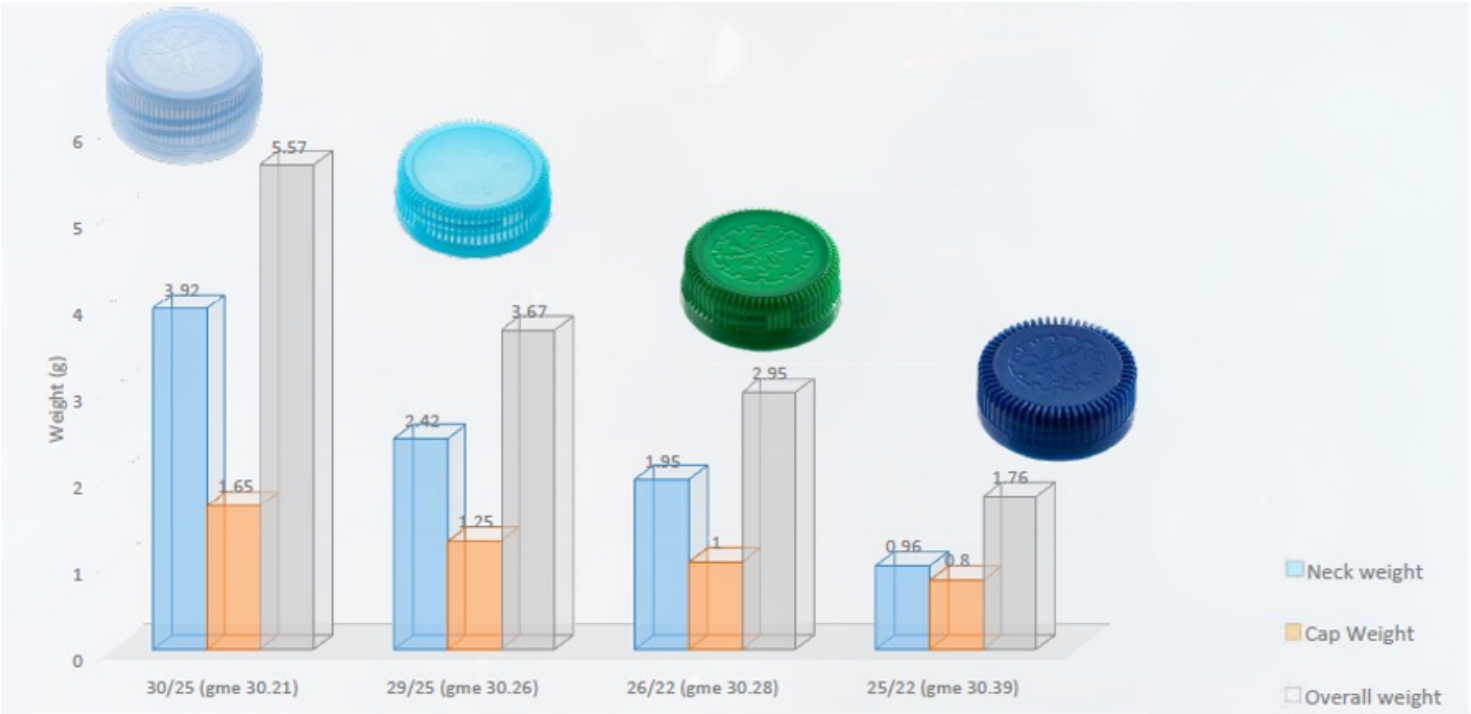
*controlled transportation

**extreme weather or specific requirements



LIGHTWEIGHTING IN CAPS AND PREFORMS

WATER TREND



Up to 70% weight reduction

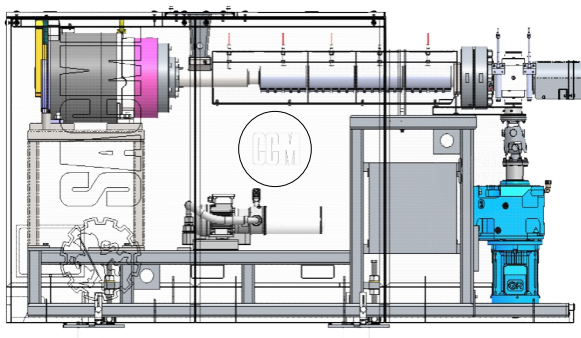


ENERGY SAVING

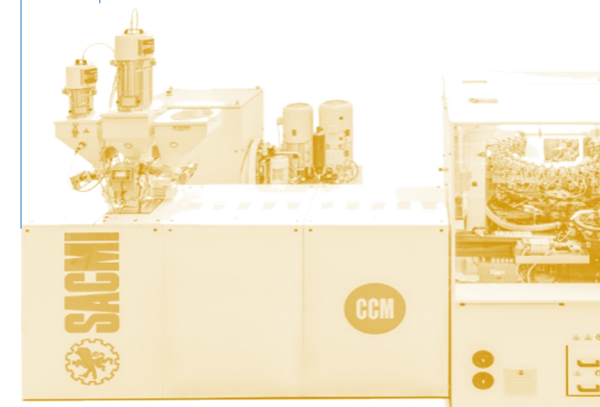
CMFLOW EXTRUDERS

CMFlow® extruders offer a number of important advantages:

- Reduction of energy consumption by up to 9%, depending on the cap format.
- Less and faster maintenance, due to the simpler motorization.
- Reduced footprint
- Higher specific throughput
- Lower melt temperature for most resins, Improved melt homogeneity



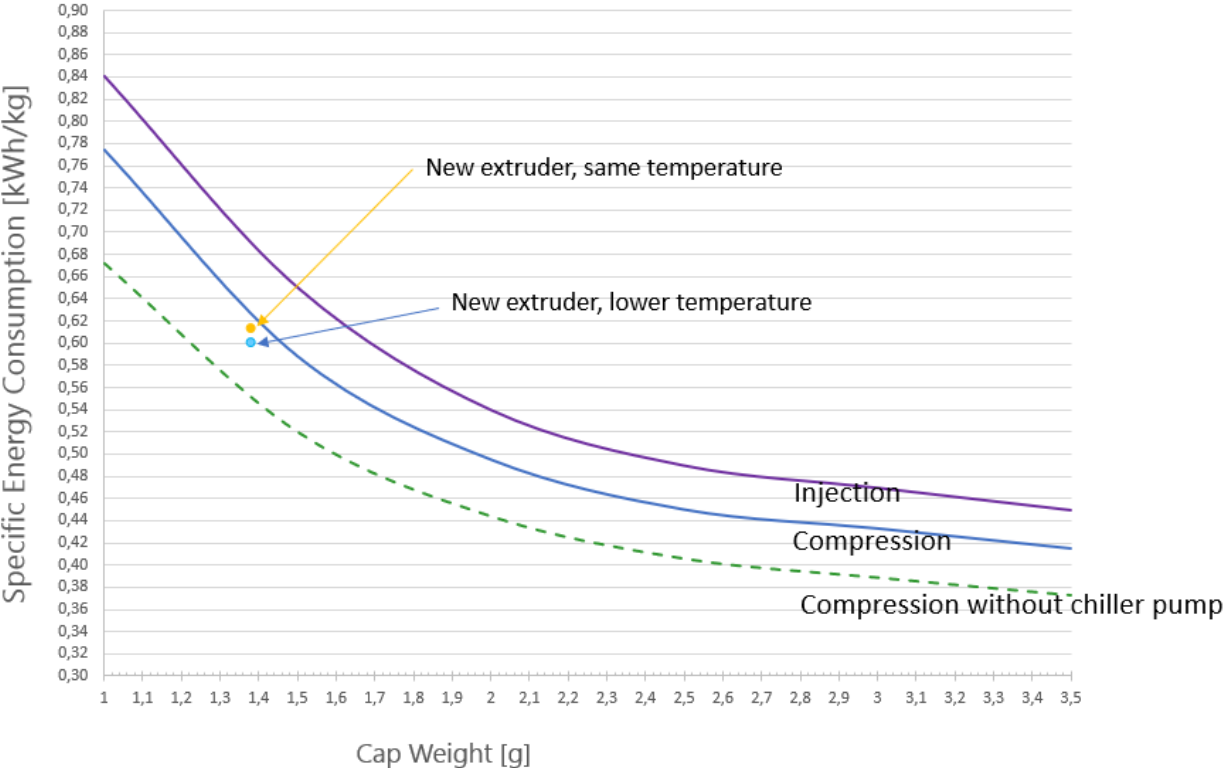
0,9 m (3 ft)





ENERGY SAVING

CMFLOW EXTRUDERS



CCM48SD

- 29/25 mm water cap
- 1.35 g
- 120,000 cph

Targeting same melt temperature

- Energy saving is 4% compared to current situation

Targeting lower melt temperature

- Energy saving is up to 9% compared to current situation



REUSE

Returnable Bottles

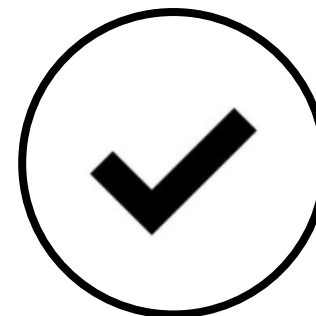


REUSE

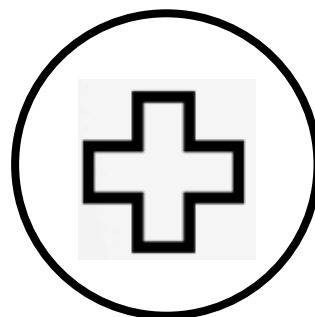
CAPS CAN'T BE REUSED



For security, must brake after first opening



For safety



For hygiene



REUSE

KEY FACTS

The amount of goods placed on the market in Europe that are packaged in reusable packaging is relatively low at present. Refillable glass bottles are already a common practice in the HORECA (hotels, restaurants and cafes) sector and is increasing in retail. The revisions of the Packaging and Packaging Waste Directive could lead to policies intending to result in movements away from single-use packaging to reusable packaging.

A well-established refillable system exists in Germany which is described in the case study below.

Refillable glass bottle systems exist in other European countries, they are at a much smaller scale than Germany, however things might change soon.

Requirements of the new French law

The French law, among other requirements, decrees that the rate of reused packaging shall be:

- **1/1/2022 1,5% Reuse**
- **1/1/2023 5% Reuse**
- **1/1/2027 10% Reuse**

The ratio is calculated including secondary and tertiary packaging (cartons, pallets, films), and apply globally to primary containers of all kinds of materials.

REUSE

DRS FOR BEVERAGE PACKAGING - GERMANY



How does reuse system works?

- After consumer purchase empty bottles and crates will take back by retail sail
- Beverage Packaging come back to the filler for sorting, washing and re-filling



REUSE

DRS FOR BEVERAGE PACKAGING - GERMANY

A "GLASS refillable bottle" can be circulated **over 50 times before recycling**

A "PET refillable bottle" can be circulated **up to 25 times before recycling**

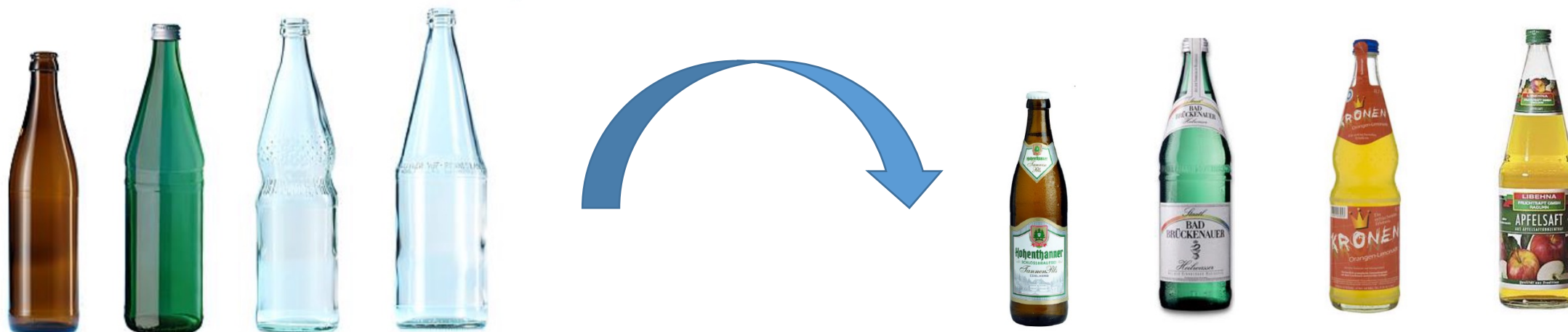
An advantage of glass refillable bottle is that it can be circulated more times than ref - PET bottle

An advantage of ref-PET bottle is that they are lighter than glass refillable bottle and this makes "PET refillable bottle" easier to handle and transport.

REFILLABLE REDUCE PACKAGING WASTE

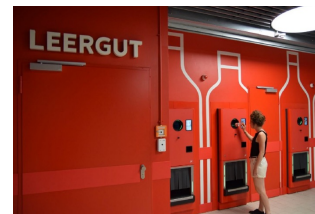
HOW TO IMPROVE EFFICIENCY AND MAKE RETURNABLE BOTTLES SUSTAINABLE

- Minimize transport distance (usually less than 200 km)
- Use of standardized refillable bottle (differentiation only by labels)



HOW TO GET A CLOSED LOOP OF REFILLABLES?

- Refillable bottles are usually returned via reverse vending machine; it helps to make the process convenient
- Economic and fiscal incentives have been designed both for consumers and for fillers



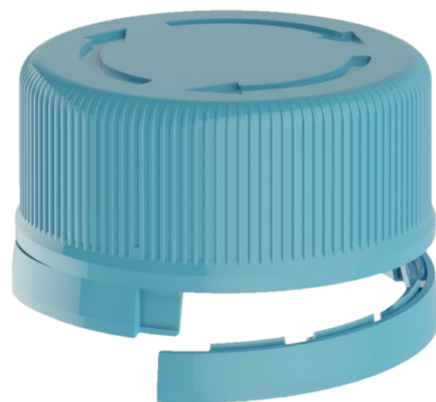
CONCLUSIONS

- 99% of the refillable bottles are returned by consumer, 95% with cap still on
- Over the entire life cycle, it is claimed that mineral water from refillables produce 50% less CO₂ emissions compared to the single use bottles.



REUSE

SACMI PROPOSAL



- Returnable neck finish based on PCO1881?
- HDPE cap shell + PE based liner for still beverages?
- PP cap shell + PE liners for CSD?



RECYCLE

Post-consumer recycled polyolefins and R-Pet
Tethered Caps



RECYCLABLE PACKAGING

EU PROPOSED DEFINITION

“Recyclable packaging is that which:

- can be effectively and efficiently **separated** from the waste stream,
- **collected, sorted and aggregated** into defined streams for recycling processes, and
- recycled at scale through relevant industrial processes such that it is turned into a secondary raw material,
-
- and of a sufficient quality that it can find end markets to substitute for the use of primary raw material.

Innovative packaging placed on the market that requires new infrastructure to be developed shall be recycled at scale within a maximum period of two years.

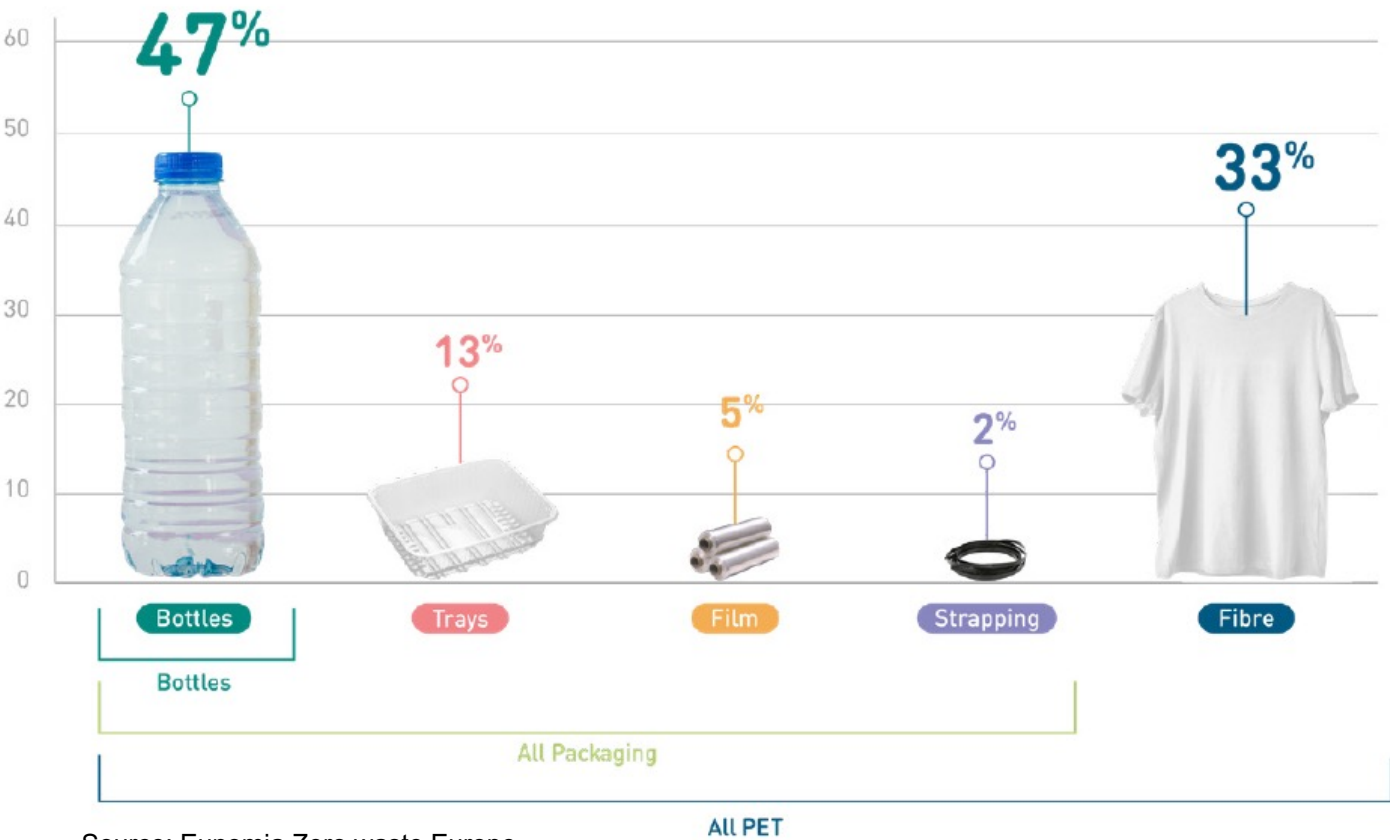
At least 95% of the functional unit of packaging shall be recyclable according to this definition, with the remaining minor components compatible with the relevant recycling process and not hindering the recyclability of the main component **at scale**.”



R - PET

PET DATA

Figure 1.2: Market shares of PET placed on market by manufacturing scope



Source: Eunomia Zero waste Europe

Of the entire PET family, PET bottle recycling has the most developed technology and infrastructure.

In Europe, the average Collection Rate(5) of PET bottles is estimated

- at 96%(6) for countries operating DRS
- at 48% in countries without DRS

This provides an overall Collection Rate for beverage and non-beverage PET bottles of 60%,



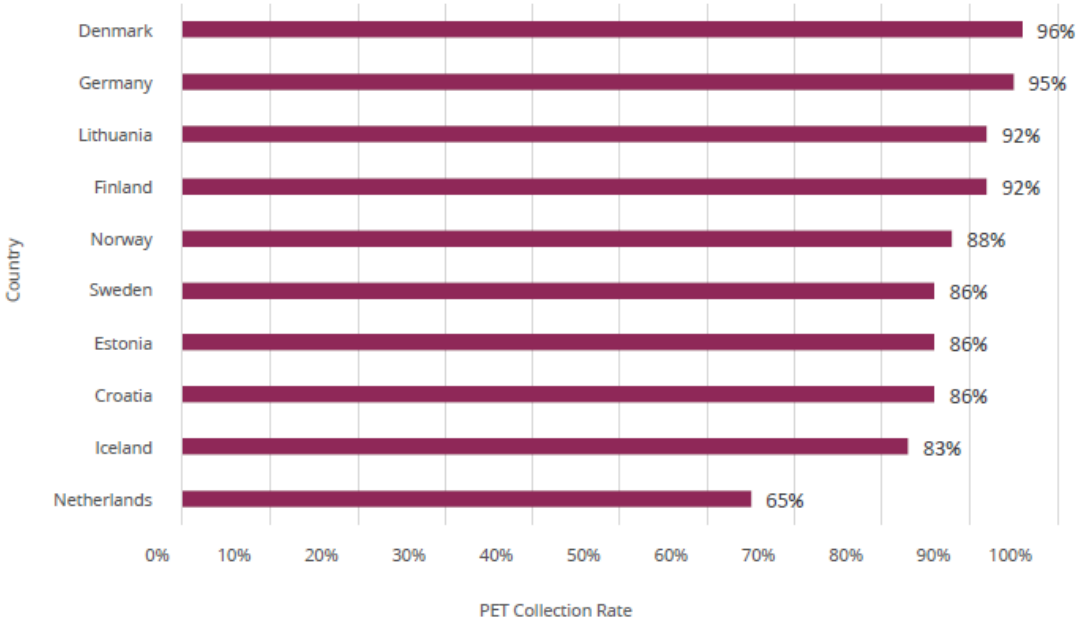
R - PET

PET DATA

DRS ESTABLISHED ²⁶		POLITICAL DECISION TAKEN ²⁷		DRS IN DISCUSSION
ICELAND	1989	IRELAND	2022	BELGIUM
DENMARK	2002	SCOTLAND		FRANCE
SWEDEN	1984	LATVIA		SPAIN
NORWAY	1999	ROMANIA		SLOVENIA
FINLAND	2008	TURKEY		BULGARIA
ESTONIA	2005	MALTA		CZECH REPUBLIC
LITHUANIA	2016	HUNGARY	2023	
CROATIA	2006	GREECE		
GERMANY	2003	POLAND	2024	
NETHERLANDS ²⁸	2005	PORTUGAL		
SLOVAKIA	2022	ENGLAND, WALES, N. IRELAND		
		AUSTRIA	2025	
		CYPRUS		

FIGURE 16: PET Collection Rates Across Countries with DRS Systems that Include PET

Source: PRE²⁹

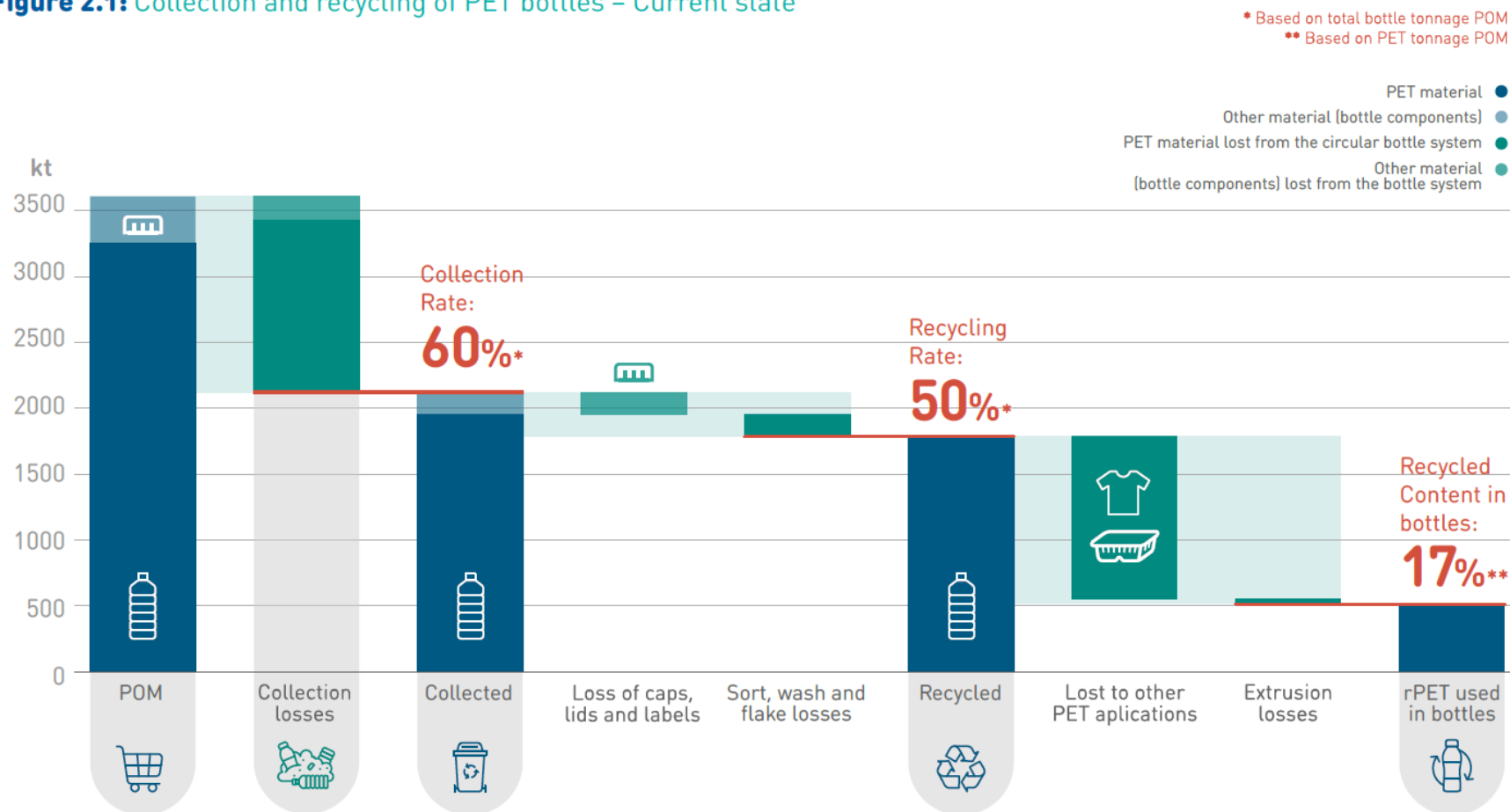




R - PET

PET DATA

Figure 2.1: Collection and recycling of PET bottles – Current state



Source: Eunomia Zero waste Europe

R-PET used in bottle manufacturing has high overall quality criteria and must be derived from bottles.

It is estimated that bottles placed on the market (POM) only comprise of an average of 17% R-PET, with the remaining R-PET downcycled into other, lower grade manufacturing applications and therefore considered a loss from the circular bottle stream.



R - P E T

KEY ISSUES

- Ineffective collection systems leading to high losses of post-consumer PET.
- Lack of availability of recyclers means some collected material cannot be reprocessed
- Contaminants from collection and sorting.
- Product design and material quality, including coloured PET and multi-material applications as well as food-grade standards for R-PET.
- R-PET economics, i.e., the market rate of R-PET compared to vPET, which is dependent on many drivers including the demand by end markets.

What directive 2019/904 says

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

- It sets a collection target for beverage bottles of
 - 77% by 2025
 - rising to 90% by 2029
- It sets targets for average recycled content within PET beverage bottles of:
 - 25% by 2025 and
 - 30% by 2030
- Plastic taxes on non-recycled/virgin plastics..

FROM DOWN-CYCLING TO CLOSED LOOP RECYCLING



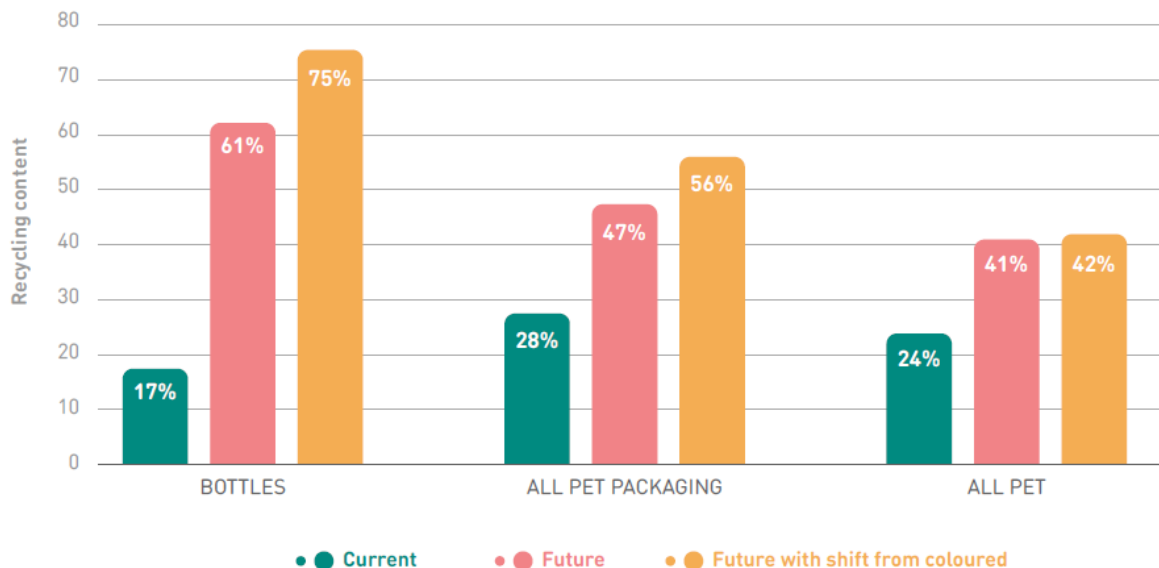
Closed loop recycling decreases emissions and preserves natural resources by reducing the use of virgin materials.

In closed loop systems all the materials in manufactured goods can be recycled back into the same type of product, without significant quality losses.

R - PET

PET DATA – RPET CIRCULARITY

Figure E-6: Recycled content by manufacturing scope



This will happen only by...

- Prioritizing bottle-to-bottle closed loop recycling instead of using rPET from bottles in other PET applications
- Increasing the use of Deposit Return Schemes, which will improve collected material quantity and quality; and/or
- Switching from coloured and opaque PET to clear PET.

In addition to the two scenarios considered for mechanical recycling there is potential for chemical recycling technologies, such as chemical depolymerisation, to contribute to PET circularity and achieve a 75% recycling content in all bottles. This industry has not reached maturity, however, and its true potential is not fully known at present, but it does appear that there is planned input capacity (sorted and clean post-consumer PET flake) of approximately 350ktpa by 2025, that could be sufficient to achieve 75% content in bottles if food contact regulations allow.

R - PET

WHAT SACMI CAN OFFER

STANDARD DRYER can work with:

- ✓ 100% rPET
- ✓ Up to 5% flakes (temporized valve)

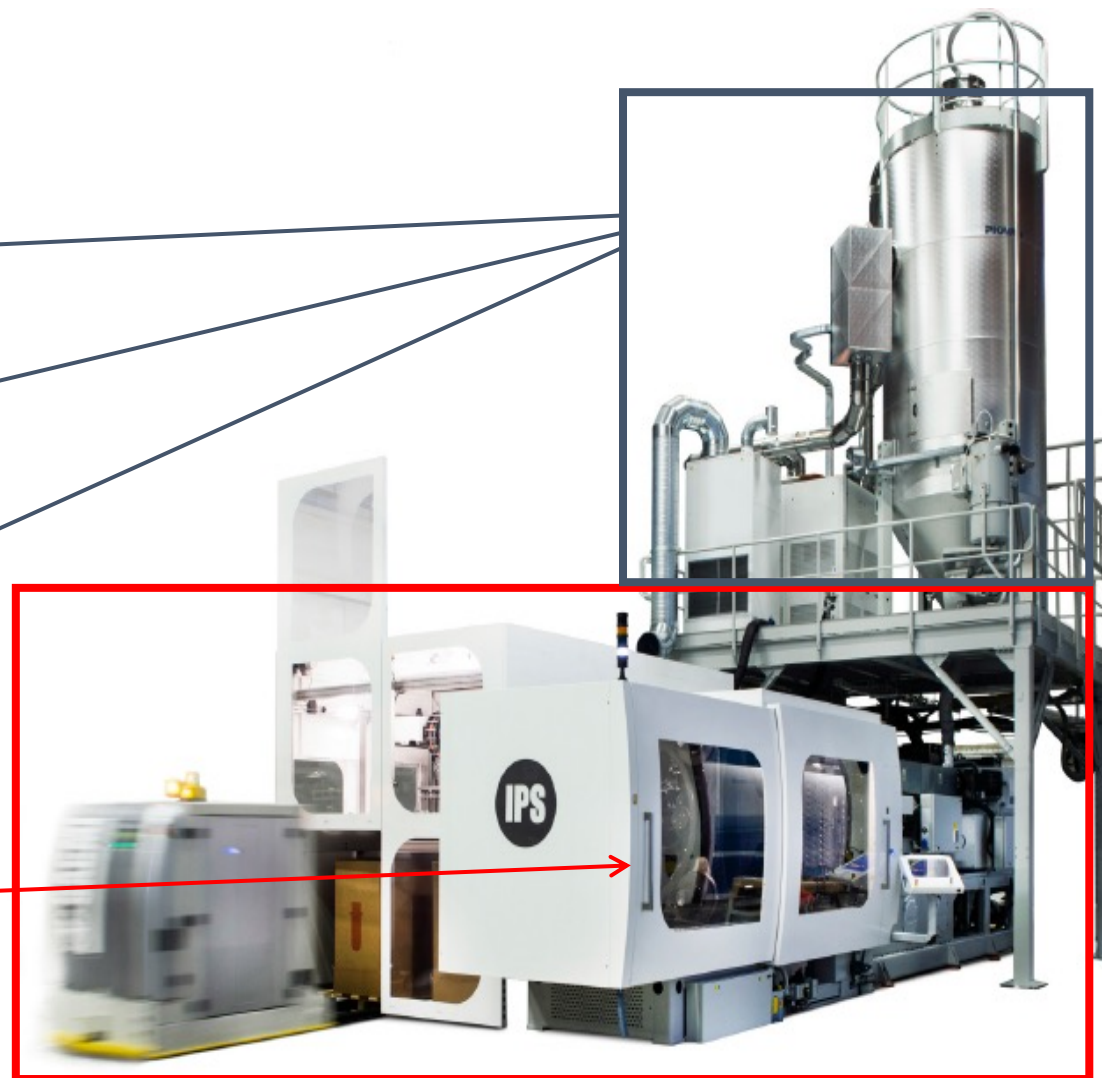
DRYER with MIXER can work with:

- ✓ 100% rPET
- ✓ Up to 25% flakes

DOUBLE HOPPER + MIXER can work with:

- ✓ 100% rPET
- ✓ Up to 50% flakes

- ✓ 100% rPET in granules
- ✓ Up to 50% of PET flakes

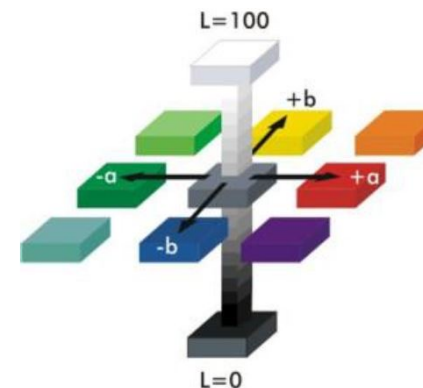


R - PET

CRITICAL ASPECTS

Possible contaminants present in recycled PET:

- PVC;
- Coloured plastics including black plastics;
- Metals;
- Plastic film, bags;
- Other non-plastics materials such as paper, glass and silicone;
- Other plastics heavier than water (PS, ABS);
- Fines, dirt, loose labels and rubber.



Quality issues related to recycled PET

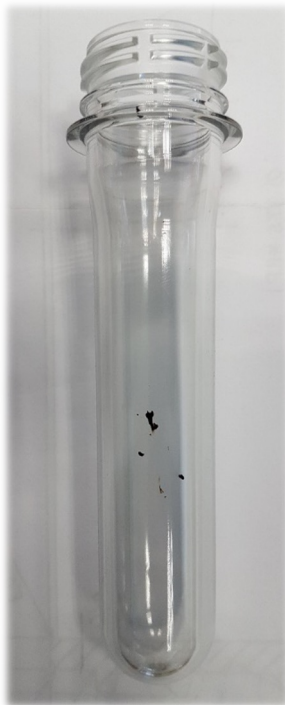
- Yellowing (impact on b value);
- Drop in intrinsic viscosity (IV);
- Haziness (due to induced crystallinity);
- Black specks.





R-PET

CRITICAL ASPECTS



Black specks



Hole on the bottle



Filler Burst

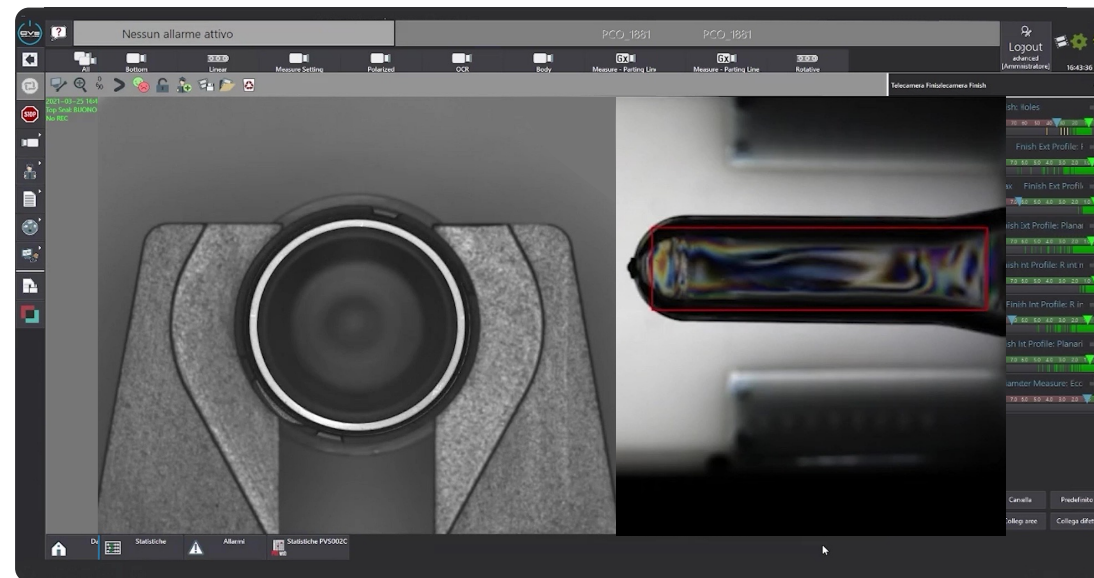


R - P E T

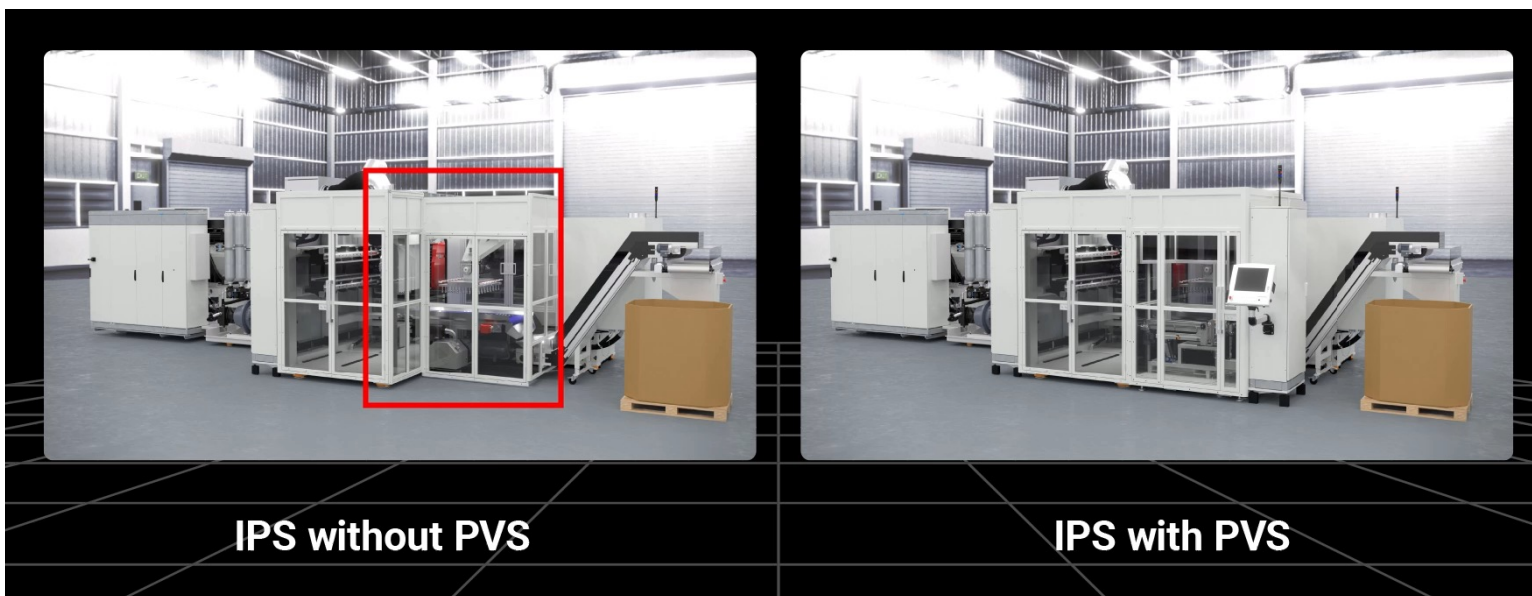
CRITICAL ASPECTS – WHAT SACMI CAN DO

PVS156 - Complete process control for preforms in PET and RPET

- one complete shot controlled every 3-5min
- Top Seal inspection
- Preform bottom Inspection
- Body defectology inspection
- Tension lines inspection
- Parting Line Thread Inspection
- Defectology inspection on the neck finish
- Preform color inspection
- Detection of the number of cavities
- Body and neck measurements ($\pm 0.05\text{mm}$)
- Temperature measurement with Pyrometer ($\pm 1^\circ\text{C}$)
- Weight control with accuracy $\pm 0.05\text{mm}$



CRITICAL ASPECTS – WHAT SACMI CAN DO

PVS156 - Complete process control for preforms in PET and RPET

- The PVS is integrated inside the IPS press
- The press footprint is not affected
- The efficiency of the press is never affected by the vision system



TETHERED CAPS

WHAT DIRECTIVE 2019/904 SAYS

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

Article 6 - Product requirements

1. Member States shall ensure that single-use plastic products listed in Part C of the Annex that have caps and lids made of plastic may be placed on the market only if the caps and lids remain attached to the containers during the products' intended use stage.
2. For the purposes of this Article, metal caps or lids with plastic seals shall not be considered to be made of plastic.

NOTE: other countries are expected to follow, for instance, at first, some states of USA and any entity willing to import beverages in the EU

PART C

Single-use plastic products covered by Article 6(1) to (4) on product requirements

Beverage containers with a capacity of up to three liters, i.e. receptacles used to contain liquid, such as beverage bottles including their caps and lids and composite beverage packaging including their caps and lids, but not:

- (a) glass or metal beverage containers that have caps and lids made from plastic,
- (b) beverage containers intended and used for food for special medical purposes as defined in point (g) of Article 2 of Regulation (EU) No 609/2013 of the European Parliament and of the Council (3) that is in liquid form.

Deadline 3 July 2024



TETHERED CAPS

KEY FACTS

Tethering a cap is not preventing littering, if someone throws the bottles outside the car window while driving on the motorway, it is litter regardless tethering. However, if the bottle is properly disposed off, the effect of tethered caps is depending on the recycling system

The directive 904 is tailored for the European recycling environment and can increase cap recycling in a system like the European one

- In Europe plastic bales are automatically sorted, using sieve with a standardized mesh size of 40 mm
- Anything smaller than 40 mm pass through and is not recycled but sent to energy recover
- A loose cap will not be recycled, a cap still on the bottle will be recycled

Understand your recycling environment, what is beneficial in Europe might not be in other parts of the world
In Asia for example, very often bottles and caps are manually separated before the bottle is recycled. In this system, the tethering might hinder the recycling of both caps and bottles

TETHERED CAPS

MINIMUM REQUIREMENTS



No cap spinning after opening, during pouring or drinking



- Separation force: **> 25 N**
- Minimum opening closing cycles: **15**



TETHERED CAPS

SACMI APPROACH

- Use slitting to create tethering mechanism
- Work on new cap designs, changing the required mold parts
- Collaboration with Thiscap®
- New mold concept/new slitting
- New lock open devices





TETHERED CAPS

SACMI SOLUTIONS



DELTA HINGE

No license

Medium opening angle



THISCAP® HOLD-OPEN

License

Best opening angle



DELTA Upside Down DUSD

No license

No locking

Easiest to manufacture

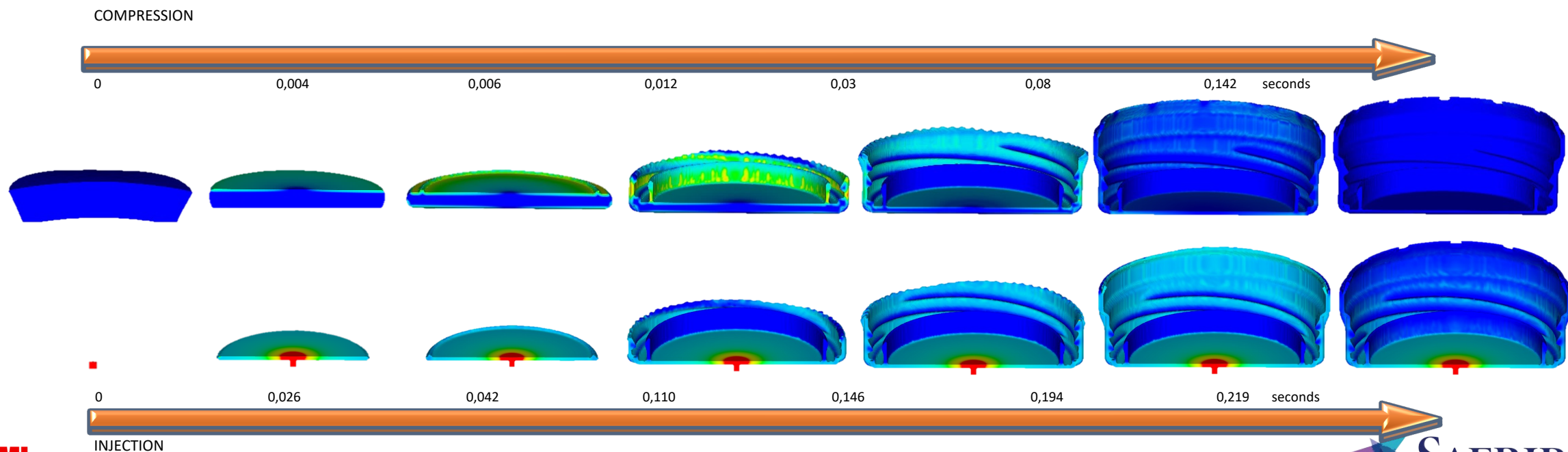
PCR POLYOLEFINS

PRO OF COMPRESSION MOLDING

Is it possible to mold caps from PCR-HDPE? Is cap to cap recycling possible in compression molding?

In principle:

- Less shear stress while processing means less degradation and increased plastic recyclability
- Less thermal stress while processing means less degradation and increased plastic recyclability
- More viscous HDPE can be used



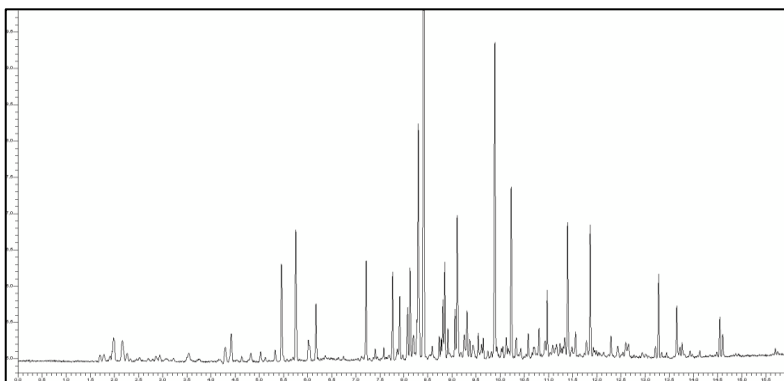
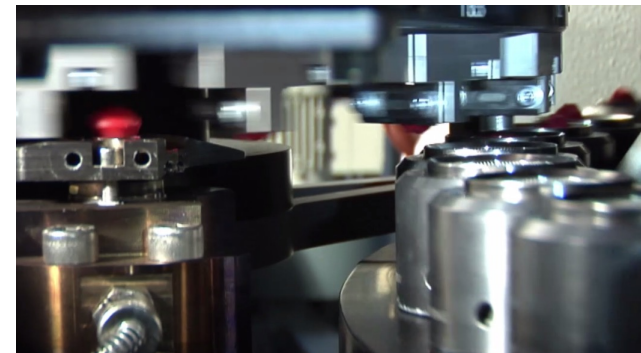


PCR POLYOLEFINS

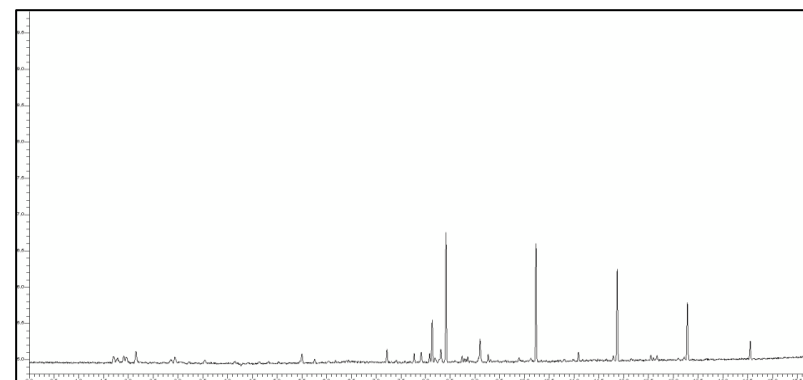
PRO OF COMPRESSION MOLDING

CCM includes an inherent plastic venting step in its process

Plastic melt emerging from the nozzle. Here a small venting process occurs



Head space gas cromatography of PCR-HDPE



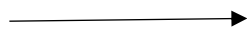
Head space gas chromatography of cap compression molded from the same PCR-HDPE



PCR POLYOLEFINS

PRO OF COMPRESSION MOLDING - POTENTIALS

Production of pristine caps



Less VOC, less degradation

Production of better recyclable caps



Being purer, they allow more recycling cycles

Wider range of viscosity can be used



More easily adaptive to viscosity changes

COMPRESSION MOLDING – WHAT WE DID

- Molded 38 mm dairy caps from recycled EBM milk HDPE bottles (up to 70% of PCR-HDPE; melt index 0,6)
- Molded PCO1881 caps from high quality PCR HDPE (up to 100% of PCR-HDPE; melt index 0,8)
- Molded PCO1881 caps from low quality PCR HDPE (up to 100% of PCR-HDPE; melt index 2)
- Molded PCO1881 caps from high PCR HDPE cap to cap (up to 100% of PCR-HDPE; melt index 2)



COMPRESSION MOLDING – WHAT WE DID

<https://www.packaginginsights.com/news/paccor-presents-recycled-hdpe-caps-ahead-of-uk-plastic-packaging-tax.html>

Paccor presents recycled HDPE caps ahead of UK Plastic Packaging Tax



21 Feb 2022 --- Paccor is unveiling caps with a minimum 30% recycled HDPE (rHDPE) for dairy products in line with the upcoming UK Plastic Packaging Tax. The tax requires at least 30% recycled plastic in all plastic packaging from April 2022.

However, the company's production team in Mansfield, UK, faced significant challenges meeting the minimum 30% mark. The post-consumer recycled material has "a different nature" to virgin polymer, but this technical obstacle was overcome through Paccor's Continuous Compression Molding technology.

In the UK, about 79% of the HDPE bottles collected are recycled, of which a high percentage are milk bottles, the company notes. On average, about 15% of HDPE milk bottles in the UK contain up to 30% recycled rHDPE material. Technical advances in the manufacture of these containers have also led to reduced material use, resulting in a lower weight for the same bottle size.

"The rHDPE produced in the UK is under pressure due to availability and demand," stresses Andreas Schuette, Paccor's CEO. "All UK bottle manufacturers are aiming for a minimum share of 30% rHDPE content to avoid plastic tax. However, thanks to our long-term partnership with the supplier, Paccor has now managed to ensure sufficient material availability and increase the content of the caps up to 40%."





PCR POLYOLEFINS

COMPRESSION MOLDING – WHAT WE DID



100% PCR HDPE

no effect on cycle time

suggested to increase 3-6%
weight in order to cope with
lower mechanical properties of
PCR HDPE

REDUCE · RE-USE · RECYCLE · RE-THINK · RE-PURPOSE



THANK YOU