WHITE PAPER
SUSTAINABILITY

re/sources. Aptar beauty

HOW THE MATERIALS FROM DISPENSING SOLUTIONS CAN

TRANSFORM BEAUTY PACKAGING FROM A LINEAR TO A CIRCULAR ECONOMY

This White Paper aims to address the solutions that are on the horizon, thanks to beauty packaging industry players like Aptar who are working to reduce their environmental impact and help the beauty industry become more sustainable.

ABOUT THE AUTHOR

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Expert in sustainability and beauty, Eva has over 15 years' international experience in the Beauty Industry, in the innovation and product development side through professional events and media. Eva helps beauty brand marketers to develop better products with sustainability at the core.
As a forward thinker, Eva is always scouting the latest trends and innovations from brands and suppliers, developing dedicated content and hosting regular events in order to support beauty professionals to make informed decisions, and build stronger brand portfolios and more robust marketing claims when it comes to sustainability.

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CONTENTS

INTRODUCTION

Producing sustainable packaging means ensuring a proper end-of-life through an integration into the circular economy.

Solutions for beauty products have become far more sustainable. Glass, aluminum, PCR, biodegradable pulp, plant-based adhesives and vegetable inks are just some of the options now available within the industry.

However, moving to more sustainable packaging and to mono-material in particular is still a challenge in the grand scheme of recycling and sustainability for certain products. From lotion and treatment pumps to lipstick mechanisms, the small multi-material complex parts needed to create an ergonomic product and a consumer-friendly experience can potentially be detrimental to the recycling process.

THIS WHITE PAPER AIMS TO ADDRESS THE SOLUTIONS THAT ARE ON THE HORIZON, THANKS TO BEAUTY PACKAGING INDUSTRY PLAYERS LIKE APTAR, TO REDUCE THEIR ENVIRONMENTAL IMPACT AND HELP THE BEAUTY INDUSTRY BECOME MORE SUSTAINABLE.

Carried out to provide beauty professionals with information on these new and improved options that are becoming available, this White Paper will also uncover what consumers expect from brands and manufacturers and how using more sustainable materials will address the consumer needs for more sustainable packaging.

PART I

BEAUTY CONSUMERS' EXPECTATIONS & THE BEAUTY INDUSTRY RESPONSE

Sustainability information is now

3X MORE IMPORTANT

to consumers than social proof or reviews when buying beauty and personal care products

9 out of 10

shoppers believe **sustainable and ethical considerations are essential** when making a beauty or wellbeing purchase.

Source: Soil Association Report

Expected packaging characteristics:
#1 Simplicity of opening
#2 Use

#3 Packaging Recyclability

Source: Citeo Shopper Study

23% of global 'eco-actives' look for products made from recycled plastics.

Source: Kantar Who Care Who Does Report

40% of consumers feel that packaging has evolved in the direction of environmental awareness.

Source: Citeo Perception of Sustainability in Packaging

Global Beauty Consumers' Expectations

Beauty consumers are increasingly more mindful of their impact on the planet and want products and services that have little to no impact on the environment.

In fact, sustainability information is now **three times more important[1]** to consumers than social proof or reviews when buying beauty and personal care products, and **nine out of ten** shoppers believe sustainable and ethical considerations are essential when making a beauty or wellbeing purchase. For some, this is even leading to a new state of 'eco-anxiety', where 67% of UK consumers[2] have become increasingly worried about climate change and its effects in 2022. So it's important to provide peace of mind to beauty buyers.

Consumers are no experts. It's one of the main reasons they are calling for brands to take the lead to help them on their sustainability journey by setting good examples, providing solutions and motivating them to adopt more sustainable habits.

Consumers believe it is the responsibility of the brand or company to educate, signpost and communicate their recommendations to help them make a conscious choice and manage the packaging end of life in the best way.

Packaging recyclability is now a pivotal factor for consumers and in terms of expected packaging characteristics, **it comes third, just behind simplicity of opening and use[3]**.

Another study found that for 'eco-actives' (shoppers who are highly concerned about the environment), **23% globally look for products made from recycled plastics[4].**

Demonstrating the need for more responsible packaging, another encouraging point is that the innovative eco designs efforts of manufacturers **aren't going unnoticed, and 40% of consumers feel that packaging has evolved in the direction of environmental awareness[5].**

For beauty brands, communication is key. With consumers waiting to learn what they can do and brands having the knowledge and power to help direct their actions, sustainable packaging continues to be a hot topic that needs to be addressed.

KEY TAKEAWAYS

- From self-care to care for the planet
- Prevent eco-anxiety with sustainable yet convenient packaging
- Educate consumers about improved sustainability features

The Beauty Industry Response

Brands realized that the linear model had to be disrupted and that recycled packaging isn't the silver bullet they hoped it would be. Instead, the answer lies in creating a circular economy that preserves resources, avoids waste and where packaging is designed to remain in use from the outset and made to last several life cycles.

Packaging manufacturers have been working tirelessly to reduce the impact of their packaging and its components via a reduction in CO2 emissions and investigating innovations that take on a circular economy approach.

Full recyclability and the incorporation of recyclable materials was the first step. The next one is refills, product that enable one to shift from single use to multiple uses.

Aptar, as a signatory of the Ellen MacArthur Global Commitment towards a circular economy, pledges that its **dispensing solutions for the beauty, personal care, home care, food and beverage markets will be 100% recyclable, reusable or compostable by 2025** [6].

"A lot of our new packaging now offers a refillable option. For example **Essencia** or **INUNE** perfume spray pumps include an optimized screwable option to enable consumers to recharge easily and safely," explains Sabine Bouillet, Global Strategic Marketing Director, Aptar Beauty

A good indicator to monitor how your packaging stands up in its sustainability claims is the Waste Hierarchy diagram which is used by brands to define clear actions such as reduction, reuse and recyclability at every step of the product life cycle.

In addition, companies are using Science Based Targets[7]. Science-based targets provide companies with a path to reduce emissions in line with what the latest climate science deems necessary to meet the goals of the Paris Agreement. Setting these targets is a five step process in which companies commit, develop, submit, communicate, and disclose on their carbon emissions data.

The use of eco-design tools and life cycle assessment methodologies can help to evaluate the environmental impact of products during the design phase.

DID YOU KNOW?

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

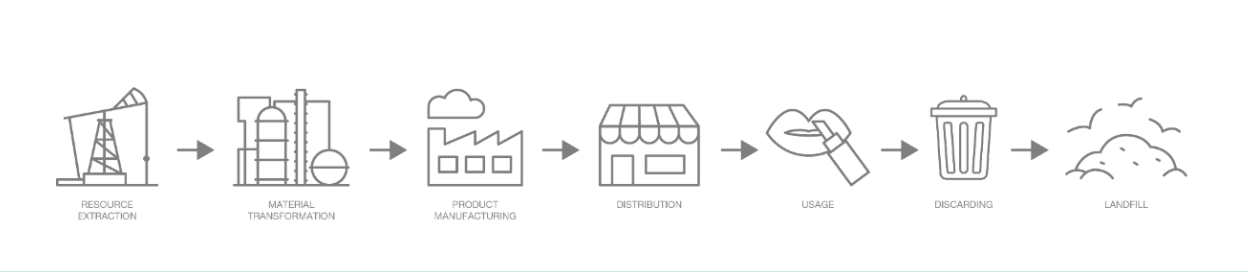
Science-based targets provide a clearly- defined pathway for companies to reduce greenhouse gas (GHG) emissions, helping prevent the worst impacts of climate change and future-proof business growth.

Companies like Aptar are setting Scope 1 and Scope 2 emissions reduction goals consistent with requirements to limit global temperature rise to 1.5° Celsius by year 2030[8]**.** Tracking and disclosing the carbon emissions of packaging components is essential to not only assessing the impacts products have on the environment, but can also be used to help consumers better understand the impact of their choices and the actions taken by brands.

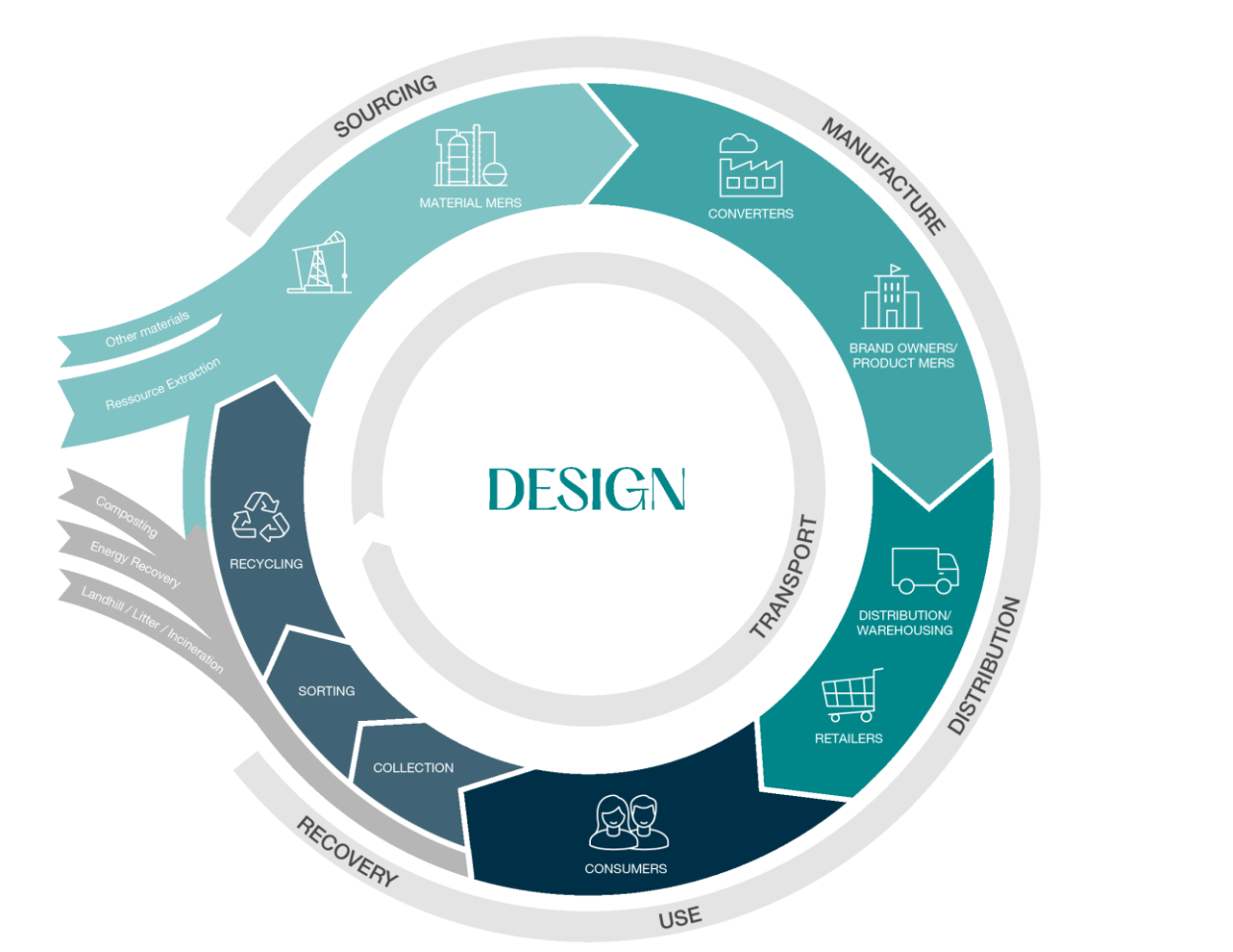
"We need to change the pattern of plastic use and keep it in a circular economy. Sometimes it could be using mono-material plastic rather than multi-material, other times it could be incorporating recycled resins," explains Bénédicte Luisi, Global Product Sustainability Director, Aptar Beauty. "We focus on ensuring the end of life has a real environmental benefit by reducing the weight of plastic and developing recyclable packaging compatible with current recycling streams."

Aptar beauty

From a Linear Economy



To a Circular Model[9]



"Driven by purpose, we continuously innovate to meet the world's evolving sustainability needs in more efficient and effective ways," said Beth Holland, Vice President, Global Sustainability. "We partner with our suppliers and customers to enable consumers to recycle more plastic, we introduce recycled materials in our products where possible, we frequently identify opportunities to reduce greenhouse gas emissions in our operations and we source renewables where available."

Aptar beauty

PART II

SUSTAINABLE MATERIALS FOR A CIRCULAR APPROACH

The complexity and beauty of a dispensing system

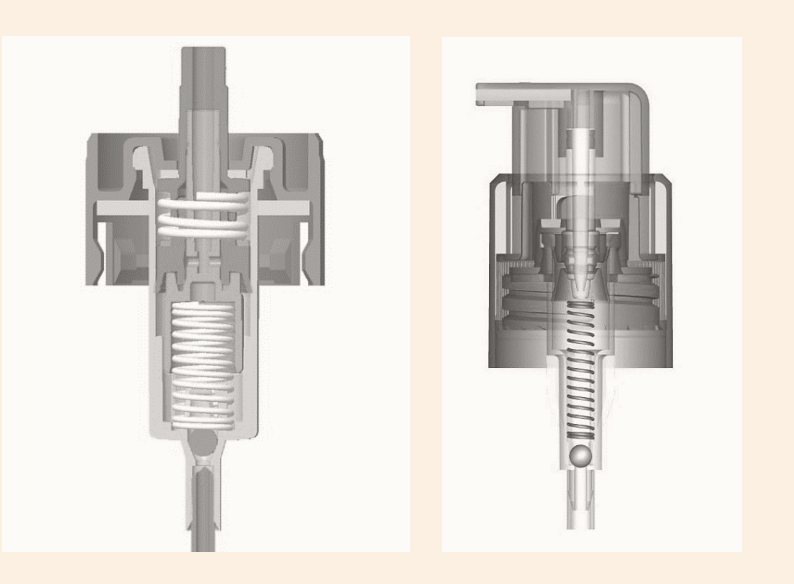
Often, the most technical parts of beauty and personal care packaging are harder to recycle due to their complexity. Traditional pumps for skincare, haircare or perfume are made of 8 to 12 multi-material components, all within a square centimeter. So, while it might look simple, it is actually incredibly sophisticated. It is also determines the convenience of the consumer's experience and aesthetic aspect, part of the brand identity. The component provides the precision of product dosage, as well as protects and safeguards the formula.
Without dispensing solutions we would apply beauty products only with the fingers: no more mist for fragrance, no more precision, dosage, convenience for skincare and color cosmetics. There would be no more droppers, perfume sprays, smart delivery systems that can deliver a precise amount of formula via intricate mechanisms and the right apertures.

"The sophistication of fragrance pumps highly contributes to the luxury experience of perfume. Aptar offers a large variety of solutions from 'short and direct' sprays to 'cloud-like' mists for a more sensorial ritual" Sabine Bouillet

▲ *Aptar INUNE fragrance spray pumps – Precious INUNE (above), Classic INUNE (below)*

Aptar beauty

"It might not be seen as a priority but it's a paramount part of the consumer experience and a decisive component for the recycling process. That's why the recyclability of our pumps has been one of the key drivers of our innovation pipeline these last years. It remains a technical challenge as a pump is made of a variety of little components with a mix of plastic and metal that all play an important role," explains Sabine Bouillet.



Aptar VP4 spray pump (left), PZ Lark lotion pump (right)

Similar to watchmaking, the manufacturing of pumps requires dexterity and mastery in the art of micro-mechanics. However, where the cogs and wheels in a watch tend to be metal, in beauty, perfume and personal care, the passing of water and creams makes this impossible because pumps are not just a dry mechanism.

In general, the spring in the pump can be made from metal, along with the actuator and fixture. There is a huge variety of pumps to choose from, as the formula and viscosity of the product - foam, spray or liquid - will dictate what's needed, how it functions, and the materials used.

That's why until now, plastic has been the safest bet given the multitude of technical aspects it offers and lightweighting.

The manufacturing of pumps also has some limitations and without using conventional plastic, performance could be hampered.

On this small technical mechanism that aims to provide technical and aesthetic performance, using recycled or more sustainable options could be a challenge to maintain technical performance, robustness, or aesthetic look. But solutions exist.

Pumps are so numerous on the market, they need to be manufactured intensively and at large scale to prove cost-effective.

"Dispensing systems involve micro- mechanics and some parts are currently challenging to develop with more sustainable options. Firstly, there is a lack of choice for technically robust resins - machinery in factories allows for 600 pumps to be made per minute so material and process smoothness, along with robustness is paramount. There is also the issue that anything that has contact with the formula must be food-contact approved so this also leaves manufacturers with less options," comments Hélène Chevalier, Formulations & Materials Engineer, Aptar Beauty

"One plan is to use various types of recycled resins wherever possible, by taking advantage of the different technologies available for more or less sensitive dispensing components. We also aim to make our pumps mono-material for specific applications like personal care where pump formats are a bit larger and where formula is usually less variable. This allows for the use of our bellow technology. For the next phase of our plan, we are continuously working in Research and Development for new resins that would be recyclable or recycled and mechanically optimal", continues Florence Roullet, Applied Sciences Director, Aptar Beauty

DID YOU KNOW?

Dispensing systems require:

- Precision of delivery
- Technicity, strength, sturdiness and elasticity of the mechanism
- Compatibility with formulas (skincare, makeup, fragrance)
- Adaptability to variable viscosities
- Spray precision
- Controlled aperture
- Complexity & functionality of design

Conventional Resins

Essentially, this is plastic as we know it. Generally, PET - Polyethylene Terephthalate used for drinks bottles, PE - PolyEthylene (HDPE or LDPE) used for shampoo bottles etc, or PP – Polypropylene used for lids and caps. All widely recyclable in most developed countries, there are now policies in place throughout Europe that are hoping to eradicate any resins that do not have their own recycling streams to be phased out by 2040 in the hope it will start to combat plastic pollution.

Introduced in the 1960s with the advent of hydrocarbon sourcing, conventional plastic resins are a byproduct of oil transformation for vehicle fuel and they quickly, and effectively, revolutionized packaging. Easy to mold into any shape or form; offering good compatibility between the inner contents and outer packaging shell; affordable and protecting against microbial contamination, air circulation or light penetration, their use spread like wildfire across every industry worldwide.

What wasn't considered was what happened to plastic at 'end of life', which has quickly led to global pollution and threat to biodiversity. It is also why packaging manufacturers, brands and companies at present are all working tirelessly to try and reverse the fate of conventional resins and ensure safe recycling or discarding and ensure that plastics does not become waste at the end of the consumer use phase. The priority is now switching to making sure they can enter the circular economy model.

DID YOU KNOW?

Conventional plastic resins are fantastic to create any shape or form; these protect beauty formulas efficiently.

PCR = Post-Consumer Recycled Resin

PCR refers to packaging that has been collected after it has been used by its intended end consumer that no longer serves its initial purpose.

The Circular Approach with PCR, PCR Plus, ISCC Certified

PCR

The abbreviation for Post Consumer Recycled Resin, PCR refers to packaging that has been collected after it has been used by its intended end consumers that no longer serves its initial purpose. It is then sorted by material type and recycled by stream - the main technology is mechanical recycling.

The most commonly recycled materials are plastics (PP, PE/ HDPE, PET), metals, aluminum and glass. However data shows that **only around 14% of plastics are actually collected for recycling[11].**

This is one of the reasons why the recycling industry is currently developing next generation sorting systems using technologies like laser and infrared to identify the size of items and types of material in order to improve recycling rates of all packaging.

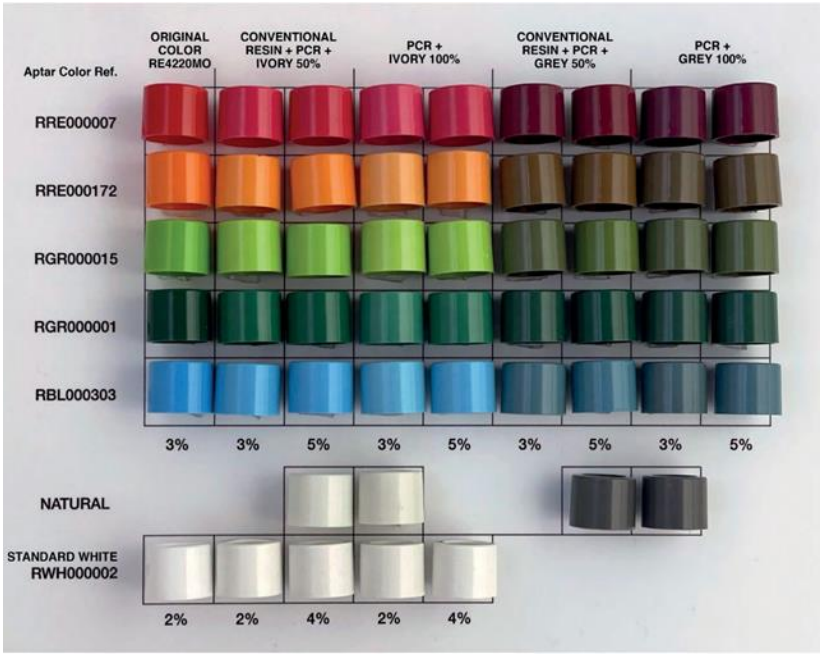
Industry players like Aptar have been working on developing products with a percentage of PCR content since 2012.

Manufacturers are also developing mono-materials, standardized designs or separable viable parts, in order for packaging to be designed specifically for recycling. This allows for better material reading at sorting plants and in turn eliminates impurities in the recycling stream, **which means a cleaner output of PCR for a more successful reintegration into the packaging cycle.**

"Mechanical recycling of conventional resins can be achieved in about four or five loops but after a while the material molecule chains are too weak to be reintegrated into packaging, or the percentage of impurity into the material is too high," explains Gérald Martines, Packaging Engineer, In-Signes

Dispensers and pumps account for around 3% of the overall packaging, they can now incorporate recycled resins or become recyclable wherever possible.

Some components in dispensers can't be manufactured using recycled resins as these may weaken the resistance of the pump to pressure. That said, luckily, the larger parts of the dispensers, such as the actuator (pump spout) or the cap can now be designed with recycled resins which increases the percentage of PCR into a pump overall.



Aptar PCR Catalog: Depending on the level of virgin and recycled resins within the material, color finishes can differ

PCR PLUS

As you would expect there are strict regulations around packaging used for beauty products because of factors such as cross contamination from the interaction between formula and packaging. For example, the European Commission states that "reference to food grade packaging could be useful for the safety of packaging in contact with a formula" (Commission implementing decision N°2013/674/EU). This does not mean that packaging or materials without food- contact approval are 'unsafe'.

It's very difficult to source food-grade resins, as the majority of recycling processes approved so far by EFSA (evaluation agency) are those using PET. This is why packaging manufacturers are working hard to propose an option as a way out to food grade certification for polyolefins in the beauty and cosmetics EMEA market.

The regulations require that all packaging meet design for recycling criteria. This also means that the different elements of a packaging (labels, caps, adhesives...) are compatible with given recycling streams.

An approach developed by Aptar called **PCR Plus** serves as a way to adapt to cosmetic requirements and regroup materials that have been individually assessed for residual contamination and toxicity in line with European health standards.

As a packaging manufacturer, Aptar is also committed to assess the compatibility between the packaging and the cosmetic formula, and to ensure that the purity of PCR Plus complies with the maximum exposure thresholds.

With PCR Plus it also allows for wider sourcing options when it comes to PCR materials which means it's easier to integrate into the circular economy as they come from a wider recycling source, not just food contact recycled sources.

Innovative solutions that allow the development of 'cleaner' PCR resins are being developed, such as ISCC certified, as we will cover in the next paragraph.

Collecting and utilizing PCR and PCR Plus does bring some restrictions. There are limited recyclable sources of packaging (PP, PE, PET), and also many varied decorations which can create impurities in PCR resins. The finished design will need to offer compromises in color and technicality.

"We are working with Elipso and Fébéa in France and with the Cospatox[12] consortium to develop a specific standard and assessment process to ensure the safety of cosmetics packaging and safe use of PCR content," explains Martin Foe.

CHEMICALLY RECYCLED PCR UNDER ISCC CERTIFICATION

Chemical recycling is a complementary technology to mechanical recycling. It allows the recycling of non-recyclable waste by modifying its molecular structure back into oil to transform it back into plastic. It works with multi-layered plastics, carpets, clothing items, composites and low-quality plastic streams. This prevents waste from going into landfill.

"Using a 'mass balance' approach determines the use of chemically recycled raw materials in a final product when both recycled and conventional materials and/or bio-based and fossil materials have been used. The ISCC process certifies every plant at each local level (rather than global) ensuring the exact percentage of recycled content," explains Gérald Martines, Packaging Engineer, In-Signes

ISCC (International Sustainability and Carbon Certification) is a global certification system that looks at the traceability and supply chain of circular and bio-based materials such as plastics, food ingredients, animal feed, chemicals and bioenergy that are **not technically recyclable.**

The ISCC-certified resins that manufacturers like Aptar source have full traceability, use plastic waste that is not mechanically recyclable. The production of recycled resins offers the same benefits as conventional plastic: no odor, no coloring nor impurities. Mechanical and technical properties are similar to conventional resins. The main limit to this technology is that it is still in its infancy, as it is being developed, limiting the availability at scale.

DID YOU KNOW?

To go even further into ensuring the highest quality of recycling, Aptar has partnered with

PURECYCLE

PureCycle Technologies, who sorts, purifies and ensures the purest quality of mechanically recycled PP, and also

NEXTLOOPP

NextLoopp, who develops the infrastructure and systems for recycling PP to food grade in major population centers.

DID YOU KNOW?

Beauty pioneers like REN have already incorporated the ISCC-certified resins into the Ever Calm Global Protection Day Cream, in collaboration with Aptar Beauty.
An industry first and proof that the concept is a successful one.

Aptar LATAM x Natura with bio-based pump made from bagasse (sugar cane waste)

Bio Based Resins & Compostable Materials

Whereas conventional plastic resins are a byproduct of fossil fuels, bio based resins are made from renewable biomass (crops waste, food waste, algae,...) and use renewable sources. Some bio based resins can be made with similar molecular structure as conventional resins, like PE, or different structures like PLA or PHA which are considered compostable.

This process is broadly used by Braskem[10] - a main manufacturer in Brazil - where industry players including Aptar are using bio based PE for the local Brazilian market for a global but locally made beauty brand.

"The current technology for bio based allows for the making of PE resins. We implemented a bio based HDPE in the outer finishing parts of a dispenser pump, the ones that interact with the consumer and allows the pump to be actuated," explains Marcelo Santarelli, Marketing & Innovation Director LATAM, Aptar Beauty

The availability of bio resins may be limited globally. There is only one well-known supplier of bio based PE, and traceability is critical to avoid competition with the food supply.

"The market is evolving in terms of recycling. We are doing our best to decrease the CO2 impact due to materials using bio based resins when possible. At the end of the day, we want to help the local markets manage waste and packaging end-of-life," continues Marcelo Santarelli

Biodegradable or compostable are also bio-based, but they are not necessarily recyclable in current recycling streams.

The primary difference between compostable and biodegradable products is that compostable products require a specific setting to break down – notably temperature, humidity, mixed with organic waste and matter - whereas biodegradable products decompose naturally. Under the right conditions, composting is a faster process.

Compostable materials sources include mycelium or cellulose and are made into PHA or PLA polymers.

Regulations are getting tighter with biodegradable claims being banned in Europe on the grounds of misleading information. Worried that they might cause consumers to simply throw their packaging into the wild, at the other end of the scale, compostable and cellulose-based materials can also disrupt recycling streams if they are not sorted correctly.

"The European draft regulation on packaging and packaging waste mandates that only a few types of packaging should be compostable and should be processed in controlled in bio waste treatment facilities. All other types of packaging cannot be deemed compostable," Martin Foe, Head of Global Regulatory Affairs, Aptar

Shrouded in confusion, it's why many big brands and manufacturers are reluctant to place products and packaging on the market made from compostable materials, Aptar included.

PART III

ANTICIPATING REGULATIONS AND PUSHING INNOVATION FURTHER

Regulatory Watch and Resins Removal

Packaging manufacturers like Aptar continue to spearhead regulatory changes around recyclable packaging and remain committed to setting new targets for waste reduction.

A member of the **Cospatox, a consortium of 38 members bringing together the key players in circular packaging** (brands, packaging suppliers, recyclers) that develops guidelines for the safe use of post-consumer plastics recyclates used in cosmetic packaging, a 'cosmetic grade' packaging as alternative to the food contact requirement. This should allow for a wider use of PCR in the cosmetic industry. They are at the forefront of implementing new policies to protect the planet.

"We are also involved in the discussion groups of the proposed Packaging and Packaging Regulation (PPWR) that was released at the end of 2022," continues Martin Foe.

"Alongside that we contribute to a working group to develop a PPWR-EU legislation that sets packaging waste reduction targets; sets design requirements for packaging and sets requirements for 'eco-modulation' of Extended Producer Responsibility (EPR). We believe our contribution will help us set achievable targets for the industry and meaningful targets for our planet."

Consumers are looking to brands to take on the responsibility to reduce waste, provide recyclable packaging, phase out single use plastics and use recycled content in packaging while brands are looking to manufacturers and producers to come up with solutions.

Bills and initiatives such as the 'Break Free from Plastic Pollution Act' and the 'CLEAN Future Act' add additional pressure onto manufacturers which has resulted in companies including Aptar remaining diligent and monitoring the potential global changes, so they can serve the beauty industry and the planet better in the future.

When it comes to controversial resins, Aptar has also anticipated regulations and has started to phase out specific materials like fluoropolymers that are a pFAS (forever chemicals), and POM (releases controversial substances) wherever possible.

The focus is now on designing for recycling guidelines, meeting the recycled content requirements or excelling in them and focusing on the reusability of packaging products to reduce pollution.

Innovative research and the replacement of conventional resins

As with all sustainable journeys, it's a learning curve. As technologies develop and advance, so do the materials produced and there are leaps and bounds being made with regards to replacing conventional resins.

Following clearly defined objectives, the priorities at this stage are:

- avoiding waste by eliminating it from the recycling streams
- developing reusable packaging and technologies
- reintegrating waste into the cycle by integrating PCR resins into manufacturing
- removing pollution and all pollutants to guarantee a full circularity of products

Naturally, it won't happen overnight and may well take years but Aptar is dedicated to researching trends in new materials and alternative materials, and compostable resins in order to anticipate forthcoming regulations and sourcing shortages.

While the desire is there, the tools to make more sustainable resins available and the legislation to make these changes feasible isn't always an easy win. For example, compostable materials are still challenging technically and regulatory wise as there is no clear recycling or composting stream for them. This runs the risk of any new technologies being slowed down by the regulators as it is an entirely new trajectory for manufacturers to take.

That being said, promising research looking into how these resins are more respectful of the environment and won't leave chemical or micro-plastics in the soil is underway and could be the proof that these are a more viable option.

Besides practicalities, there is also the fact that conventional resins are working well in packaging and have been tested and tried for years, making them an easy and effective go-to for brands.

Switching the materials would mean developing an effective new recycling stream, which would admittedly be a herculean task. Considering that conventional resins have been on the market for over 50 years, most PET bottles, for example, are widely recycled compared to other packaging, which are still a work in progress, even if the technology was launched in the 90s.

The prospect of finding and producing a replacement with a reliable recycling solution seems ambitious with a deadline of 2030 (in Europe), but the packaging industry is already working hard to increase and reach full recyclability of all its current production, with already a milestone in 2025.

Market, Technical and Regulatory Challenges

In the current market, various challenges exist that affect both consumers and manufacturers.

From a consumer perspective, there is a growing need to reduce carbon emissions and improve their overall quality of life. This can be achieved by offering products that are easy to recycle and also incorporate recyclable and sustainable materials, thereby contributing to the reduction of waste and and possibly leading to CO2 reduction.

Additionally, the development of functional products that enhance consumer convenience and satisfaction is crucial.

On the technical front, manufacturers face the challenge of limiting resource usage and transitioning towards sustainable resins. This necessitates the adoption of better materials, such as those that are recycled, recyclable, and reusable, following the 3R approach (Reduce, Reuse, Recycle).

It is important to improve post-consumer recycled (PCR) resins and design products for recycling to enhance the collection of high-quality recycled feedstock, taking into consideration the limitations in recycling technology.

Lastly, **regulatory challenges** arise, including restrictions on resin types. Currently, only three streams, namely PP, PE, and PET, are permitted for recycling, thereby limiting the range of recyclable resins. Moreover, the prohibition of biodegradable materials raises concerns about potential hindrances to innovation in the industry.

"Our role is to identify and anticipate market trends to ensure materials' safety overall.
This means:

- Sustainable material is safe for the environment
- Regulation is safe in terms of regulatory trends and laws
- Public Health is safe for consumer use

The target is for Aptar to achieve 10% recycled resin content by 2025" adds Hélène Chevalier

Addressing these consumer, technical, and regulatory challenges is crucial to foster a more sustainable and environmentally conscious marketplace.

PART IV

THE FUTURE LIES IN THE CIRCULAR ECONOMY

"AT APTAR, WE AIM TO KEEP PLASTIC IN THE ECONOMY, OUT OF THE ENVIRONMENT"

– Beth Holland

Packaging manufacturers are taking action to ensure our industry is progressing towards a circular model.

Overall moving from a linear to a circular model will take time, as the entire Life Cycle of a product needs to be considered (from sourcing raw materials, to manufacturing, using and discarding). Some innovations will be straightforward and easy to implement, and some will be a lot more complex - there is no 'one size fits all' or 'quick fix' solution.

What is crucial to remember is that the problem of packaging today lies mainly with the end of life or lack thereof. Historically, plastic has been managed in a way that created a lot of waste. Organizations across the globe are currently working to address the waste issue, to minimize the negative impact of these materials in the future.

Making the most out of available resources, moving towards a circular economy to minimize the depletion of natural resources, reducing pollution and plastic waste and achieve sustainability in economic growth is an essential move. As part of this, Aptar has signed the Ellen MacArthur Foundation Commitment[13] and has developed training throughout the entire company to support the initiative within the organization.

Integrating Recycled Materials

As a first step in tackling waste, companies are taking measures to capture and incorporate materials from waste feedstock into their design. For instance, Aptar has integrated recycled content into its iconic solutions, with PCR, PCR PLUS or ISCC certified resins.

The **EVOCLASSIC** pump for skincare and makeup comes with an average of 30% PCR*, and can be produced from 50% PCR on the actuator, cap and one-piece fixture, with a PCR PLUS material. That allows for up to 9-11% of CO2 reduction for this packaging solution, depending on the exact product configuration.

The **S7 aerosol actuator** for foam or spray applications can be made from 100% mechanical PCR, which reduces the carbon impact (CO2) of up to 63%*.

Another possible tactic to help create an effective circular economy would be for governments and industry bodies to consider a recycling stream per industry - for instance Food-Drink stream on the one hand and Cosmetic on the other hand - to make collection, sorting and recycling easier, more efficient and generate better quality, purer PCR feedstock. At some point the food industry may require a dedicated stream, as they are losing food grade compliance by being mixed with cosmetic packaging.

* *Calculation on material impact using Aptar EcoDesign tool. No third party review*

Aptar beauty

Aptar Future mono-material pump. Winner of multiple awards: Formes de Luxe 2022, PCD Innovation Awards 2023 Skincare-Premium, 2022 AmeriStar Awards, 2023 WorldStar Winner, The Sustainability Awards 2022 in E-Commerce, PackTheFuture Sutainable Packaging Award 2023

Developing Recyclable Designs

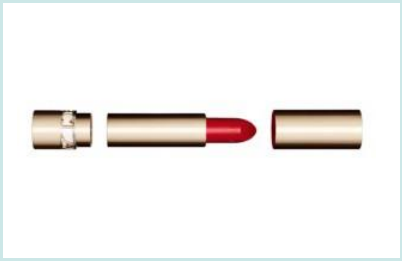
Mono-materials are also paving the way for better recycling results and will become a huge part of the circular economy. Significantly increasing the possibility of packaging being recycled, the **FUTURE** dispensing pump created by Aptar is mono-material and fully recyclable when paired with a PE or PET bottle. Suitable for a range of viscosities and customizable with dosage options and neck sizes as well as being available in a range of colors, it is available using post-consumer resin (PCR). The Future pump has won many awards for its innovation.

Another market example of a mono-material dispensing and fully recyclable solution was the first mono-aluminum lipstick of our modern time, by LUSH.

Developing a Reuse Model

In parallel to using recycled content and developing recyclable solutions, solutions providers like Aptar are active in the field of reuse models that work at elevating the consumer experience through refill/reuse, especially in fragrance, face care (airless), lipsticks and personal care. This is done through Aptar's own solutions or through partnerships.

Aptar Beauty Gaïa

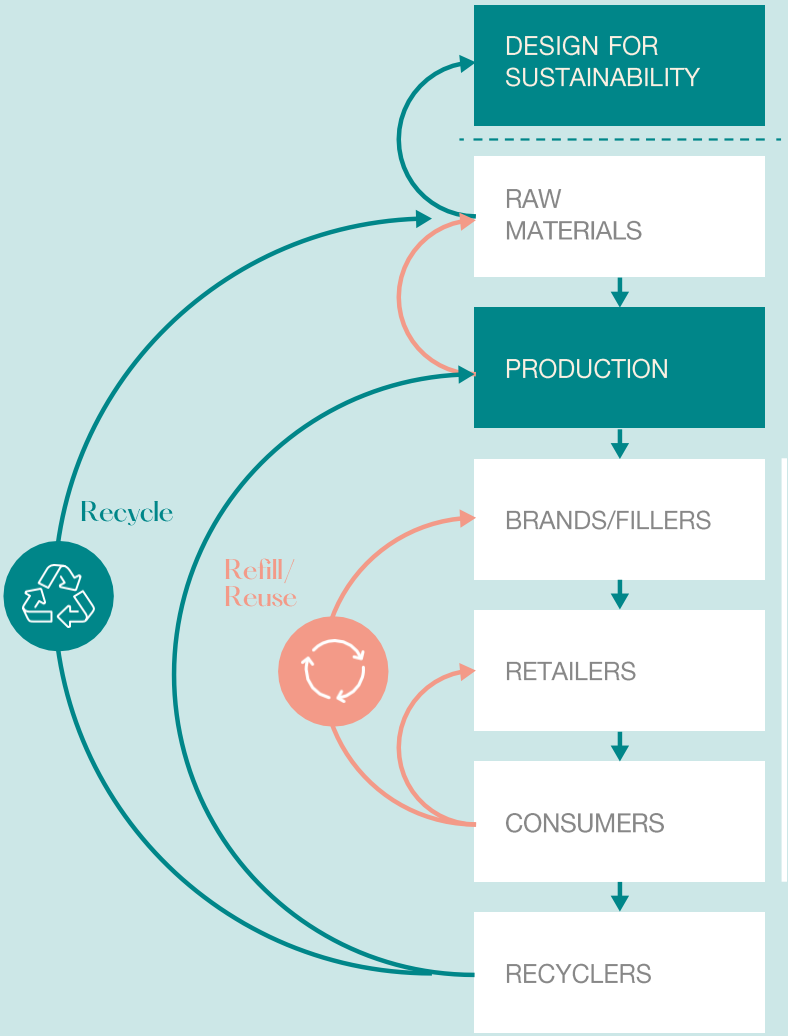


Aptar has developed **Gaïa**, a premium refillable airless solution to elevate packaging to a new level of sustainable luxury. The premium design features a metal collar, transparent container and twist-to-lock actuator outer casing. The refillable cartridge is fully recyclable thanks to its mono-material design (PE and PP). All consumers need to do is simply push the button on the bottom to discard the cartridge and replace.

Aptar developed the full package for Clarins Joli Rouge lipstick with an exclusive, made-to-measure, decorated casing and Private Refill mechanism. The casing contains PCR and the mechanism is free of POM, styrene and silicone. When compared to the first use cycle, the subsequent refill shows a 45% reduction of carbon emissions, and this main pack can be used repeatedly.

Aptar beauty

Aptar Contributes to a More Circular Economy[14]



With innovation and design for sustainability at the forefront, Aptar utilizes tools like product life cycle assessments to design products and processes that contribute to a more circular economy.

Our eco-design tools help Aptar and our customers select more sustainable materials. We also work with our suppliers to identify lower carbon solutions and processes.

Aptar minimizes the impact of our production through operational eco-efficient programs that mitigate climate, water, and biodiversity risks as well as advance resource efficiency and circularity.

Our innovative solutions and eco-efficient operations enable our customers: brands, retailers and consumers, to meet their sustainability targets.

Aptar works with a number of organizations to understand recycling stream process, limit barriers to recycling, and optimize design recycling guidance.

Our journey toward an effective and functional circular economy requires intense and deliberate collaborations — across sectors and industries. As system thinkers and change-makers, Aptar is committed to working alongside, and often leading, others on identifying solutions, processes and products that enable us all to move forward together.
A sample of the organizations we partner with includes:

Memberships

SPICE, wrap, CACE, Rede de Cooperação para o Plástico, wbcsd, CE100, RecyClass, APR

Partnerships

NEXTLOOPP, Ellen MacArthur Foundation, Loop, PURECYCLE

Aptar beauty

It's Just the Beginning

"More than just recycling (the order of environmental preference is Refuse, Reduce, Reuse, Repurpose, Recycle), for companies such as Aptar it's a case of looking at existing methods and materials, anticipating the end of fossil resins and energy and developing renewable feedstock, bio-based or captured-carbon content or alternatives to plastic,"
Christophe Marie, Director of Product Sustainability, Aptar

With innovations and technologies ripe for development and solutions in sight for reducing the industry's reliance on fossil fuels, by reinventing the way products are dispensed, it will revolutionize the end life of products and help guarantee materials actually make it to the relevant recycling methods.

Another area of research and innovation that industry players like Aptar are developing **is reducing the carbon impact of the overall value chain.** Developing and incorporating recycling materials into current applications already works towards reducing waste while decreasing carbon emissions. Keeping a close look at the Life Cycle Assessment offers clear action points at every step of the way.

The main target is to reduce impact instead of buying carbon credits through carbon offsetting strategies, which is currently under scrutiny.

The European Union is working on a Green Directive[15] that will ban "carbon neutral" claims based on carbon offsetting. It will take longer, but reducing carbon at the source will have more impact on the overall Life Cycle and truly benefit the future.

Dispensing systems are an essential part of the packaging, even though they may be small in size compared to the overall packaging. We hope this White Paper will help you make smarter decisions in your product development and go a long way to support your educational communication to consumers about packaging.

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