Coatings: unlocking sustainable packaging

May 25, 2023 by Iris Arsic

Sarah Dubail, senior regulatory analyst at Sherwin-Williams Packaging Coatings, France, discusses a vital role of metal packaging in the three pillars – to optimally use, reuse and recyle packaging – laid out in the European Green Deal and Circular Economy Action Plan.

These practices will also help with getting a grip on food waste, a pervasive problem in Europe, she writes. It's imperative for the entire packaging supply chain to collaborate and innovate new technologies to bring to market sustainable packaging solutions. With can coatings being equally important in delivering the many benefits of metal packaging for food and beverages, Dubail tells us more about Sherwin-Williams' first non-BPA (bisphenol A) epoxy coating technology – valPure V70.

Putting an end to wasteful packaging

Packaging plays an essential role in our daily lives – it protects and preserves products, allows the global transportation of goods, and increases product

integrity. However, due to poor disposal and recycling practices, packaging waste has been identified as an escalating and pervasive global environmental issue.

According to research by Eurostat, between 2009 and 2020, the total mass of packaging waste generated in Europe rose by 20% – up by 13 million tons.[1] To tackle this issue, policymakers and regulators are setting ambitious targets and measures to prevent packaging waste and promote the reuse and recycling of packaging.

In Europe, the European Green Deal and Circular Economy Action Plan set the stage for a comprehensive review of how we use, reuse, and recycle packaging. The goals enshrined by these plans aim to further advance the sustainable transition of the packaging value chain by ensuring that all packaging in Europe is reusable or recyclable by 2030.

The latest regulatory milestone in the development of a more sustainable packaging supply chain in Europe is set out in the proposed Packaging and Packaging Waste Regulation (PPWR), which aims to significantly reduce packaging waste in Europe by 2040 by encouraging reuse and recycling. To meet these targets and achieve a fully circular economy, the whole packaging supply chain needs to collaborate and innovate to develop new technologies that enable sustainable packaging solutions.

Metal packaging and the fight against waste

The metal packaging industry is well-placed to contribute to the circular economy goals of the European Green Deal. Aluminium – the main metal used in beverage cans – is infinitely recyclable and the process for recycling is highly energy efficient. In fact, almost 75% of the aluminium that has ever been produced is still in use today.[2]

Not only does metal packaging reduce packaging waste through recycling practices, but it also plays an important role in reducing food waste. The Food and Agriculture Organisation of the United Nations (FAO) estimates that around 90 million tons of food is wasted in Europe alone.[3]

This is largely due to the inadequate preservation and storage of food, emphasising the importance of innovative packaging solutions to help tackle this.

Metal packaged goods are an essential part of the global supply chain and are relied upon to ensure access to affordable, safe and long-lasting food and beverages, which is particularly important amid a time of high food prices and a cost-of-living crisis.

But, for cans to work as a reliable packaging solution, they need can coatings manufacturers like Sherwin-Williams to develop high performing and innovative coating technologies.

The metal can can't act alone

Can coatings play a critical role in delivering the many benefits of metal packaging for food and beverages. Various types of can coating technologies have been developed over the years to meet the demands of consumers and the packaging requirements of brand owners.

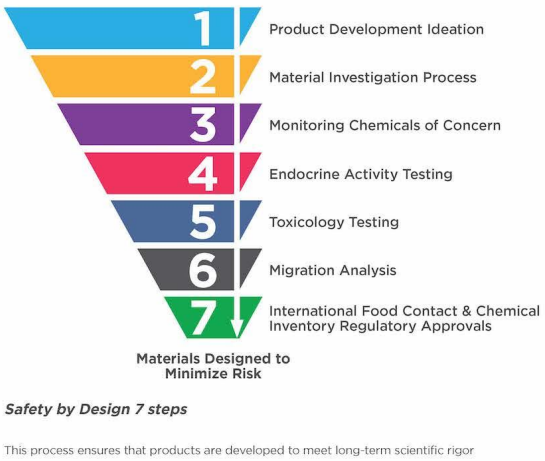
Epoxy coatings have long been the preferred technology of choice for much of the metal packaging industry, owing to their cost competitiveness, robust application and fabrication properties, and excellent corrosion resistance and flavor performance. However, in recent years the industry has been challenged to develop new technologies that don't contain BPA, a key monomer used in traditional epoxy coating technologies.

Most recently, the European Food Safety Authority (EFSA) published a new scientific opinion that significantly lowers the proposed tolerable daily intake (TDI) for BPA, setting the stage for the conversion from traditional epoxy coatings to non-BPA alternatives in food contact materials across Europe.

Developing next generation can coatings: Sherwin-Williams valPure V70

In response to customer requests, at Sherwin-Williams, we embarked on a ten-year research and development programme to create a coating with the performance benefits of traditional epoxy coatings without using BPA. However, developing a technology without the use of BPA presented a significant technical challenge both for us, and the industry.

New non-BPA technologies, such as acrylics and polyesters, often couldn't offer the same flavuor, corrosion, and application benefits as legacy BPA epoxies. To identify a viable alternative, we pioneered a product development methodology, Safety by Design, which is modelled on preclinical pharmaceutical safety evaluations and is designed to ensure the longevity and safety of new coating technologies.



Safety by Design 7 steps

This process ensures that products are developed to meet long-term scientific rigor

Through this process, we identified TMBPF as a monomer that could replace BPA in epoxy coatings whilst maintaining the same application and performance standards the industry expects without the regulatory challenges presented by BPA. As well as the required regulatory testing, the Safety by Design process involved substantial investment and hundreds of additional tests to demonstrate that TMBPF is not a chemical of concern or endocrine-active and that it protects food safety and meets our customers' high-performance standards. Following further engagement with

NGOs, independent laboratories, toxicologists, and universities, we created the industry's first non-BPA epoxy coating technology – valPure V70.

Through continued commitment to innovation and a desire to achieve the best performing coating technology that could meet global regulatory requirements, valPure V70 delivers on the challenging performance requirements of the metal packaging industry, bridging the performance gap that the industry has observed with other technologies, such as acrylics.

The innovative valPure V70 technology provides a long-term solution for one of the world's most sustainable forms of packaging and has the potential to enable the transition to metal packaging for other sectors of the food and beverage industry that have traditionally favoured glass and plastic for their products.

With more consumers making purchasing decisions with sustainable packaging in mind, aluminium beverage cans are continuing to grow in new product areas, like wine in cans.[4] Wine is a technically challenging product to pack and high performing coating solutions, like valPure V70, are needed to enable the continued growth of the canned wine industry.

The transition to a more sustainable packaging industry

Metal packaging has a key role to play in the shift to a more sustainable packaging industry and the development of valPure V70 supports this by enabling metal packaging to work successfully as a sustainable solution for the food and beverage industry.

To support the future requirements of the packaging industry, we need continued cutting-edge innovation, such as the development of valPure V70, to keep pace with packaging trends. At Sherwin-Williams, we

remain a key partner in this journey, working tirelessly to ensure our can coating technologies enable Europe's future sustainable packaging requirements, supporting a fully circular European economy.