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# Compounding WORLD

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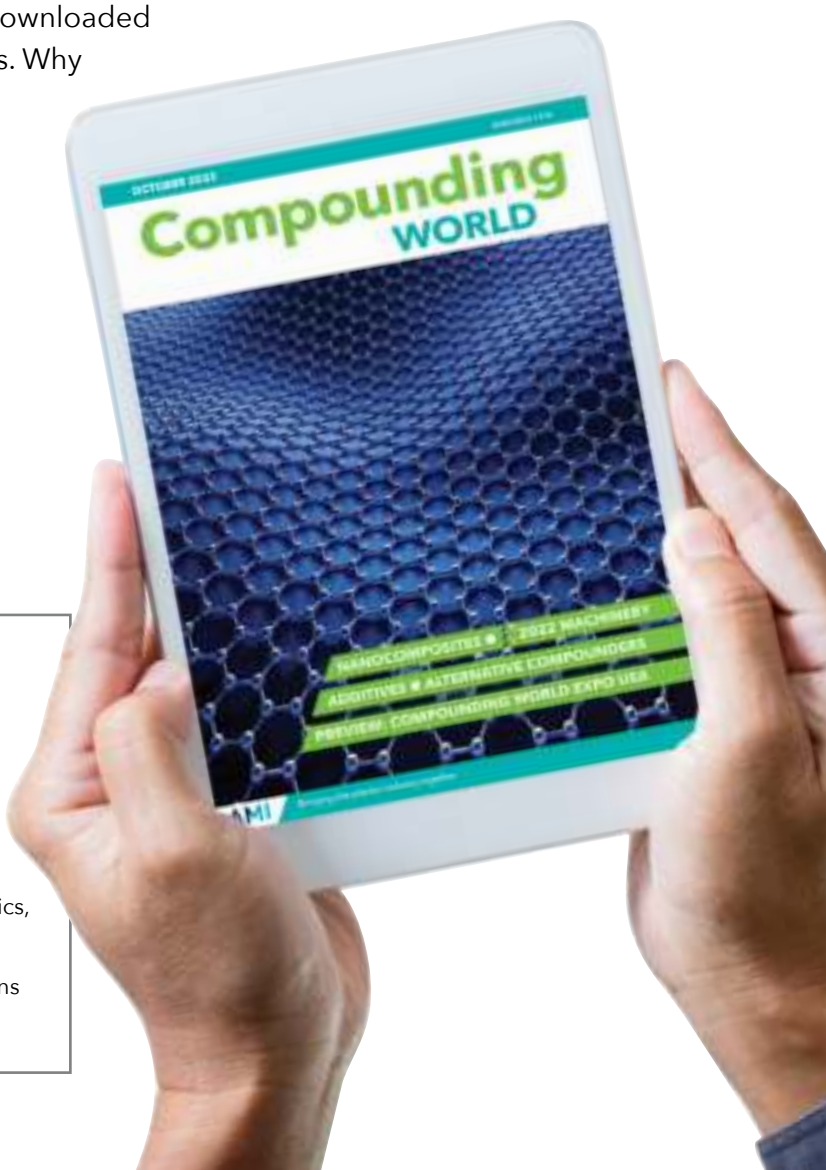


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## DISCOVER THE AGENDA AND BOOK TODAY

# UN plastics pollution treaty talks break down

What was planned to be the final round of talks on a UN global treaty on plastics pollution ended without agreement on 2 December. Instead a "Chair's Text" was issued at the end of the INC-5 talks in Busan, South Korea, which is intended to serve as the starting point for negotiations at a resumed session in 2025.

The Reuters news agency reported that the most divisive issues included capping plastic production, managing plastic products and chemicals of concern, and financing to help developing countries implement the treaty. A proposal by Panama, which had the support of more than 100 countries, called for a cap in global plastics production, but this was opposed by some countries with major polymer facilities.

The INC Chair, Luis Vayas Valdivieso, said in a statement: "Our mandate has always been ambitious. But ambition takes time to land. We have many of the elements that we need, and Busan has put us firmly on a pathway to success. I call on all delegations to continue making paths, building bridges, and engaging in dialogue."

IMAGE: SEUNGHYEOK CHOI

**A demonstration before the INC-5 talks in Busan, South Korea**

In response to the end of the INC-5 talks, Plastics Europe, which represents Europe's polymer producers, repeated its commitment to an agreement based on collaboration to promote plastics sustainability in the framework of a circular economy.

Virginia Janssens, MD at Plastics Europe, said: "Although we were hoping for an ambitious and implementable legally binding agreement, we believe that progress has still been made in Busan. While no final text was agreed upon, we recognise convergence in several articles of the chair's non-paper including those on product design and waste management."

Graham Forbes, Greenpeace's Head of Delegation, said: "For the next meeting, the assignment for member states is clear: the ambitious majority must break through fossil fuel influence and the obstruction of a few, to deliver an effective agreement with binding global targets and measures to reduce plastic production."

He also called for protections against dangerous chemicals, along with bans on single-use plastics, reuse targets, and an equitable financing plan.

› **www.unep.org**
› **https://plasticseurope.org**
› **www.greenpeace.org**

## Amcor and Berry plan merger

Amcor and Berry, which have combined revenues of $24bn and adjusted EBITDA of $4.3bn, have entered into a definitive merger agreement.

The merger will bring together two worldwide production and commercial networks to create what they said is "a global leader in consumer packaging solutions, with a broader flexible film and converted film offering for customers, a scaled containers and closures business, and a unique global healthcare portfolio".

The combined group would serve more than 140 countries through approximately 400 production facilities.

The transaction has already been unanimously approved by both boards and is expected to close in mid-2025. Peter Konieczny will serve as CEO, Graeme Liebelt as Chairman and Stephen Sterrett as Deputy Chairman. The new entity will be named Amcor and its global head office will remain in Zurich, Switzerland.

› **www.amcor.com**
› **www.berryglobal.com**

## Ineos shuttering styrenics site in US

Ineos Styrolution is to permanently close its ABS and SAN styrenic materials production site in Addyston, Ohio, US, from the second quarter of 2025 due to growing competition from imports.

"After a thorough analysis, we concluded that the substantial investment needed to continue operations and achieve profitable cost competitiveness makes this site no longer economical," said Steve Harrington, CEO of Ineos Styrolution and Ineos ABS.

He said the decision to close the Addyston site was driven primarily by external market conditions.

› **https://ineos-styrolution.com**

## Xenia expands into 3DP

Italian thermoplastic producer Xenia Materials has expanded into the FDM/FFF 3D printing sector with the introduction of a 3DF Materials family of products, offering users a complete range of filament-based solutions for different applications.

The range includes Xecarb SL 3DF featuring a 100% bio-based PA11 polymer matrix reinforced with 15% carbon fibre, Xelight 3DF which combines polyether block amide's (PEBA) flexibility and impact resistance with Xenia's specialised engineering, Xecarb 45 3DF, a modified PVDF with 10% carbon fibre, which is designed for applications that require both structural integrity and resistance to chemically aggressive environments, and Xegreen 23 3DF which has been developed from 100% recycled polymers and fibres.

› **www.xeniamaterials.com**

# Hexpol to acquire PA compounder Piedmont

Swedish polymer group Hexpol is to acquire 80% of the shares in US-based polyamide compounder Piedmont Resin Supply for around $86m.

Piedmont was founded in 2013 and has grown to become one of the largest independent nylon compounders in the US serving a variety of customers within automotive, transportation, and the furniture industries, said Hexpol.

The company operates a manufacturing facility in Cartersville, Georgia, and has a turnover of around $60m, with profitability on a similar level to that of the Hexpol group.

Jan Wikström, President Hexpol Thermoplastic Compounding, said: "The acquisition of Piedmont adds new capabilities, application know-how, and a new customer base to Hexpol Thermoplastic Compounding in the US."

The Piedmont website shows its capabilities to be: annual capacity of more than 70m lb; four twin screw production lines; multiple blending stations with capabilities up to 120,000 lb; state-of-the-art full laboratory testing; custom compounding and toll services supplying a variety of materials; and 140,000 sq feet of operating and warehouse space.

Under the agreement, Hexpol has an option to acquire the remaining shares in Piedmont, and the founders have an option to sell their remaining shares to Hexpol.

› **www.hexpol.com**
› **www.piedmontresins.com**

## New TPE production line for Geon

Geon Performance Solutions has started up a new thermoplastic elastomer (TPE) manufacturing line at its facility in Ramos Arizpe, Coahuila, Mexico.

The new line will produce a range of polymer compounds, including TPE and thermoplastic vulcanizate (TPV), supporting Geon's strategic expansion of its polymer capabilities. The expansion also builds on the technology and expertise obtained from the company's acquisition of PolymaxTPE in December 2023.

Alberto Rios, General Manager of Geon Mexico, said: "The Ramos Arizpe facility can now better support local customer growth with enhanced formulation, prototyping and sampling services, ensuring Geon remains a key innovation partner for the markets we serve."

Geon is a portfolio company of SK Capital Partners.

› **www.geon.com**

## Surf's up for Mocom

IMAGE: SIEVE FINS

German surfboard fin manufacturer Sieve Fins is using Mocom's WIC PP compound with recycled content in its products.

"We are delighted that Sieve Fins selected our compound," said Werner Aumüller, Senior Business Development Manager at Mocom. "This partnership reinforces the fact that recycled materials can deliver high performance and quality without compromise."

The material, which combines lightweight construction with 30% recycled content, has been specifically designed to meet the rigorous demands of surfing, providing exceptional stability and durability. These features are essential in surfboards, where fins must endure harsh conditions such as saltwater exposure and intense usage.

› **www.sievefins.com** › **www.mocom.eu**

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# Plastics Europe reports output declined in 2023

Total plastics production in Europe declined 8.3% in 2023 to 54m tonnes compared with 2022, with production of mechanically recycled post-consumer plastics dropping by 7.8% to 7.1m tonnes, according to figures published by Plastics Europe. These figures contrast with a 3.4% global increase in plastics production, and mean that Europe's share of the global market has declined to 12%.

Whilst Europe has maintained a positive trade balance in value terms, in tonnage terms it became a net importer of plastics resins in 2022 and plastic finished goods in 2021, while exports of resins fell by 25.4% between 2020 and 2023. In addition, only 0.12m tonnes of chemically


recycled plastic was produced in Europe in 2023, while bio-based and bio-attributed plastics production slightly increased to 0.8m tonnes.

"Europe's eroding competitiveness threatens our industry's circular plastics transition," said Plastics Europe. The shift threatens the viability of the European plastics value chain, it said, which currently supports more than 1.5m jobs across 51,700 companies and generated more than €365bn in turnover within the EU in 2023.

"The EU's transformation to a circular plastics system is in acute danger from imported plastics which do not always meet EU standards," said Marco ten Bruggencate, President of Plastics Europe, and President of Dow EMEAI. "The hard truth is that we already see EU manufacturing plants being shut down, leading to offshoring of the industry, jobs and sustainable investments. The circularity transition will only be successful if policymakers urgently implement the framework conditions needed to regain our competitiveness."

› **https://plasticseurope.org**

## IN BRIEF...

The newly-created **Women in Plastics Italy** association (WIP-IT) held its first assembly on 29 October in Cremona, Italy. Miriam Olivi was elected as President along with four other board members.

**Coperion** and **Herbold Meckesheim** hosted a two-day recycling conference in the newly opened Recycling Innovation Centre in Weingarten, Germany, on 6-7 November 2024. The event featured a variety of presentations and live demonstrations.
**https://coperion.com**

The **Chemistry Industry Association of Canada** (CIAC) has named Rocky Vermani, Senior VP Nova Chemicals, as its new Chair of the Board of Directors.
**https://canadianchemistry.ca**
**www.novachem.com**

**Syensqo's facility in Marietta, Ohio, US**

IMAGE: SYENSQO

# Syensqo expands Udel PSU production

Syensqo has expanded production of its Udel polysulfones (PSU) polymers at its Marietta, Ohio, US facility by more than 25%.

The company's PSU polymers are used in life-saving and life-supporting applications, such as in systems for hemodialysis and medical instruments, as well as playing a critical role in water purification, and contributing to green hydrogen production systems. Designed to perform under demanding conditions, the materials offer high strength and rigidity, flexible sterilisation options, and high resistance to cracking, even at elevated temperatures.

"Since we embarked on this expansion journey for our sulfone polymers business three years ago, the trend towards higher performing materials with a balanced level of strong mechanical, thermal and chemical properties has continued to grow," said Peter Browning, President Specialty Polymers at Syensqo.

The production increase at the Marietta site complements a recent expansion at the company's facility in Augusta, Georgia.

› **www.syensqo.com**

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Shamrock Recycles

## OCSiAl opens CNT facility

Luxembourg-based OCSiAl has opened its first European production plant for carbon nanotubes (CNT) in Serbia.

The new 10,000 m², ISO 9001-certified facility will be dedicated to producing the company's TUBALL nanotubes and nanotube-based products, as well as housing lines dedicated to various nanotube dispersions, R&D, and quality control laboratories. The facility employs a modular design that enables rapid scalability and operates on hydroelectric power.

"This facility's strategic location in Serbia will enhance the supply of advanced nanotube solutions across Europe, Asia, and the US," said Konstantin Notman, CEO of OCSiAl Group. "It will initially produce 60 tonnes of graphene nanotubes per year; we plan to double this output with a second synthesis unit in the coming year."

› **https://ocsial.com**

# Injection Molding Expo to take place in Cleveland

AMI's Injection Molding Expo will take place on November 12-13, 2025 at the Huntington Convention Center in Cleveland, Ohio, USA. The focused exhibition and dedicated conference will both be free to attend.

Building on the success of the Injection Molding and Design Expos that ran in Detroit in 2022 and 2023, the exhibition takes place in its own dedicated hall adjacent to AMI's Plastics World Expos. These include four shows focused on plastics compounding, recycling, extrusion and testing. They will be open on the same days as the Injection Molding Expo and visitors will be able to attend all expos for free. The Plastics World Expos attracted 376 exhibitors and 5,676 attendees this year.

"This combination of well-established expos will create a comprehensive showcase for the plastics industry, while allowing exhibitors and visitors to benefit from focused shows with their own dedicated conference theatres," said Andy Beevers, events director at AMI.

IMAGE: AMI

**AMI's Injection Molding Expo, held in Cleveland next year, is free to attend**

The Injection Molding Expo is designed to help the injection moulding community identify new opportunities and learn about new technologies, materials and equipment. Visitors to the Injection Molding & Design Expo will include injection moulders, OEMs, Tier Ones, brand owners, design consultancies and mould makers, all operating within a wide range of end-use markets. These include the automotive, packaging, electrical and electronic, medical, industrial and consumer sectors.

The Expo will fill Hall A at the venue. It will feature suppliers of: injection moulding machinery; ancillary equipment; automation systems; moulds; hot runners; machine and mould components; plastic resin and compounds; additives, masterbatch and liquid colours; design and analysis software; and a variety of industry services.

› **https://www.injection-moldingexpo.com**

# Alphagary installs new compounding line

PVC compounder Alphagary, part of Orbia's Polymer Solutions business, has announced a significant expansion of its manufacturing facility in Altamira, Mexico.

The company is installing a new production line to process PVC materials with FDA-sanctioned ingredients, while adding 15,000 tonnes/yr to the facility's production capacity. The expansion project began in July, with the new assets expected to be operational by the current quarter.

Santiago Urbina, Vice President Commercial at Orbia Alphagary, said the company has seen increased demand for specialised materials, particularly in sectors like healthcare and food safety, where the quality and safety are vital.

› **www.alphagary.com**

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# SABIC launches PEI production at new plant in Singapore

SABIC has officially launched its new $170m Ultem polyetherimide (PEI) resin manufacturing facility in Singapore, the company's first in the region producing the high-performance thermoplastic. The new facility is a strategic move to support SABIC's goal of increasing global Ultem production by more than 50% in response to growing demand in the Asia-Pacific region.

"The Ultem resin facility reflects our long-term commitment to the region's high-tech economies and advanced manufacturing sectors, supporting the growth of advanced applications," said Abdulrahman Al-Fageeh, CEO, SABIC. "Singapore's widely networked trade agreements also provides us with competitive access to markets in the region."

IMAGE: SABIC

**Left: Attending the plant launch were dignitaries including Singapore government minister Low Yen Ling (centre)**

SABIC said its advanced materials have become integral to Singapore's role in facilitating sustainable, high-tech manufacturing, extending to the automotive, healthcare, and telecommunications sectors.

With strong support from the Singapore government, the new facility benefits from the nation's strategic position as a regional hub and its extensive free trade agreements network, the company said.

› **www.sabic.com**

# ExxonMobil to boost chemical recycling operations in US

ExxonMobil has announced plans to invest more than $200m to expand chemical recycling operations at its sites in Baytown and Beaumont, Texas, US. The new operations are expected to start up in 2026, and will add a combined 350m lb/yr of capacity.

The company has set a goal of reaching 1bn lb/year of recycling capacity globally by 2027.

"At our Baytown site, we've proven advanced recycling works at scale, which gives us confidence in our ambition to provide the capacity to process more than 1bn lb of plastic per year," said Karen McKee, President of ExxonMobil Product Solutions.

ExxonMobil has also obtained exclusive rights to sub-license Neuvokas' proprietary manufacturing process of GatorBar, composite rebar, in markets outside of North America.

› **https://corporate.exxonmobil.com**

# Alterra engineering agreement

Neste, Alterra, and Technip Energies, have signed an agreement to provide a standardised solution based on Alterra's proprietary liquefaction technology to parties interested in building capacity for chemical recycling.

This solution will come in the form of readily designed and engineered liquefaction plant modules, allowing for lower pre-investment costs, accelerated implementation time, high predictability on project economics, and reduced overall capital costs.

› **www.neste.com**
› **https://alterraenergy.com**
› **www.ten.com**

## IN BRIEF...

**Arkema** and **Authentic Material** have partnered to offer new compounds for 3D printing or traditional extrusion and moulding processes based on combinations of recycled leather and Rilsan polyamide 11 or Pebax TPE pellets to be sold under the Qilin brand.
**www.arkema.com**
**www.authentic-material.com**

**Aduro Clean Technologies** and construction pipe producer **GF** Building Flow Solutions Americas have signed a MOU to advance circular solutions for crosslinked PE waste, which follows completion of a technical evaluation.
**www.adurocleantech.com**
**www.georgfischer.com**

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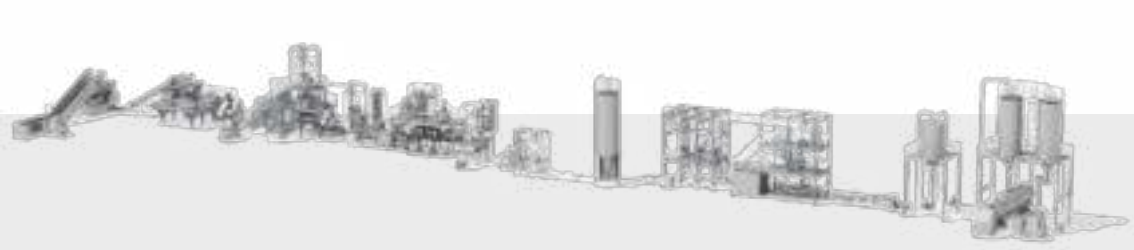

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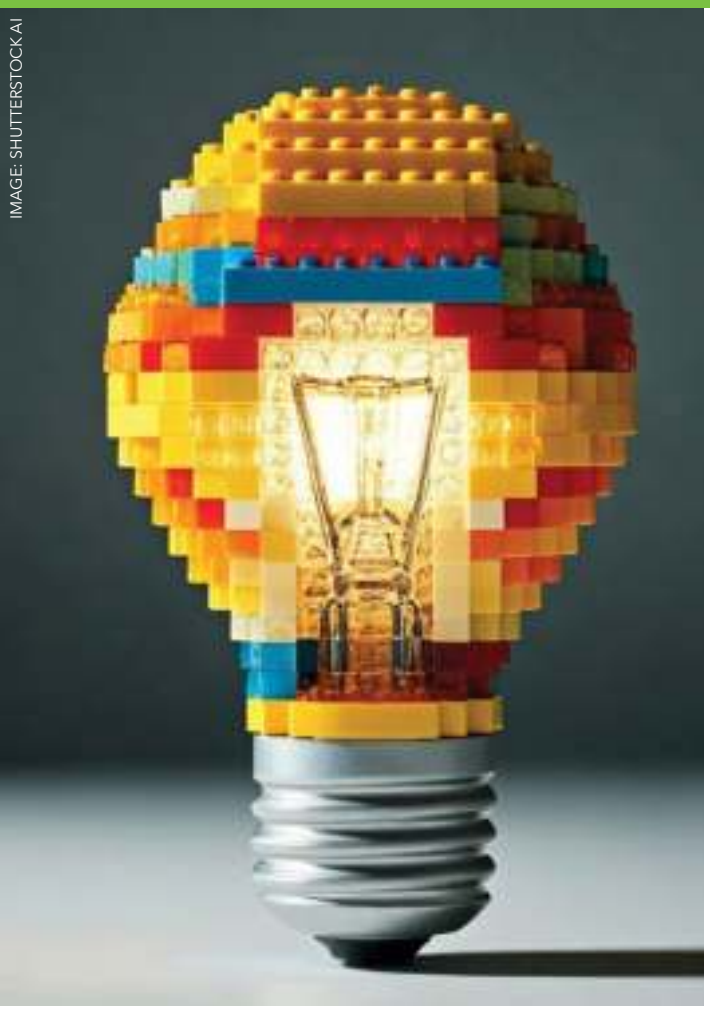


IMAGE: SHUTTERSTOCK AI

# Insights from masterbatch market experts

***What are the major trends in the thermoplastics concentrates market? Jennifer Markarian interviews industry experts to learn about the forces affecting masterbatches and their producers***

Insights into the current and future position of the masterbatch (thermoplastic concentrates) industry were shared by Hanne Jones, Senior Consultant at **AMI**, at the North American edition of the Compounding World Expo in Cleveland, US, in November. In a keynote speech at the exhibition organised by *Compounding World's* publisher AMI, she noted that globally the approximately 16bn lb demand for concentrates is split nearly evenly between additive, colour, black, and white concentrates. With packaging accounting for nearly half of global demand for concentrates, the pressure to reduce packaging waste plays a significant role.

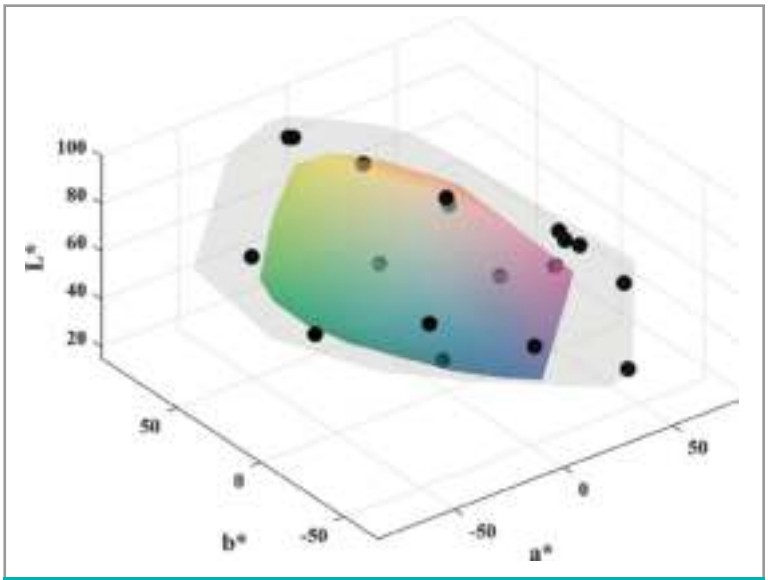
Additive concentrates are expected to have a faster growth rate than other segments, with growing demand for stabilisers, compatibilisers and other additives to maintain properties of recycled materials and increase part durability. Changes in plastic part design as companies move to designing for recycling and to meeting the requirement to include more recycled material will offer challenges and opportunities for concentrates suppliers.

"The global masterbatch industry continues to experience unprecedented challenges; from fluctuations in demand to raw material volatility and constant changes in customers' service needs," said Jones. "The result of this is an ever-present challenge to executive decision-making and the management of participating companies."

Jones said that in response to the industry's needs, AMI is launching a new Global Masterbatch Dataset to provide a current and comprehensive analysis of the global thermoplastic masterbatch industry, which will be available in January 2025. The dataset provides comprehensive demand and production data for black, white, colour, and additive masterbatches by region, with breakdowns by 14 polymer types and multiple industry sectors, including industrial and consumer packaging, agricultural applications, automotive and transport, and building and infrastructure.

There had been some discussion a few years ago that colour would be broadly removed from packaging to improve recycling. While there have been a few applications that have moved to colourless, this change has not materialised for most applications and colour demand remains strong.

Many brands across packaging and other industries have realised the importance of customised colours to increase visual appeal to attract consumers and retain consistent brand identity, said Doreen Becker, Director of Sustainability at **Ampacet**. "These needs are not new, but what is new is the need for brighter and more consistent coloration of PCR [post-consumer recyclate]. We have also noticed that the industry has widened its




**Avient says its PCR Color Prediction Service digital tool allows users to visualise, in real-time, the colour possibilities and limitations of different types of PCR**
***Source: Avient***

tolerance for colour specifications due to the inconsistent colour of PCR, which range from almost as colourless as virgin resin up to a very dark gray," said Becker.

New technologies, including in-line measurement and control, promise to help meet the challenge of colour variability. Some of these technologies were discussed in the November-December issue of *Plastics Recycling World* magazine. Ampacet's new LIAD SpectroMetric 6 is one such system for real-time colour adjustments.

## PCR demands

"We know that many sophisticated PCR manufacturers attempt to minimise colour variation in plastic products by sorting PCR pellets based on shades and using separate pigment masterbatches," said Becker. "However, grayish colour variations still persist, leading to inconsistencies in the final product. The SpectroMetric 6 system eliminates colour variations by integrating the continuous loss-in-weight gravimetric blending system and Spectro in-line spectrometer. [Using] Ampacet's mono-pigment masterbatches and advanced patented correction algorithms, the system delivers precise colour corrections to the recipe by making incremental adjustments. This ensures consistent colour quality throughout the extrusion process and reduces colour costs by eliminating off-colour finished goods."

In addition to packaging, Becker sees growth in demand for colour in the electrical and electronics (E&E) market, which is growing as society relies increasingly on electricity and telecommunication. Ampacet's new ELTech masterbatch line designed for E&E applications includes colours and combinations of colour and functional additives.

**Avient's** PCR Color Prediction Service, which was launched in 2022, simplifies the colour decision-making process during product development and launch, and meets the need for brand owners who want to understand how colours will appear in recycled polymers. "Our digital tool allows users to visualise, in real-time, the colour possibilities and limitations of different types of PCR. This helps optimise the balance of virgin resin and PCR to achieve the best possible coloration," said Sandrine Reboux, Senior Marketing Manager Personal & Home Care Market and Digitalisation at Avient. "Many packaging brand owners have expressed interest in this service, and we also see growing interest from companies in the automotive, electronics, and various other consumer sectors."

## Colour shift

Reboux continued: "We are not witnessing a decrease in colour requests but rather a shift in expectations regarding visual appearance. For example, in the case of PET packaging, primarily used for bottles, recycling guidelines are becoming stricter to ensure a high-quality recycling stream. Consequently, transparent-colored bottles are becoming more popular, especially in European countries, where this trend is anticipated to continue. Additionally, we observe that brand owners and manufacturers across various packaging products and other industries are increasingly adopting a recycled aesthetic characterised by more subdued colours, matte finishes, or textured effects."

"In Europe's E&E industry, there is growing pressure to incorporate more recycled materials from waste electrical and electronic equipment," said Benoit Flammang, Senior Marketing Manager E&E at Avient. "This includes materials like polypropylene and technical polymers such as polycarbonate and polystyrene, which are essential for producing new components. Consequently, there is a demand for colour masterbatches that are specifically tailored for recycled materials, as the colours obtained from these materials may appear less vibrant. Additionally, there is a need for additive solutions that can maintain the necessary performance levels in terms of strength, stability, and fire resistance for such applications. Avient addresses these challenges by combining colour and additives into custom Smartbatch solutions, providing optimal coloration and performance results," said Flammang.

"In the automotive industry globally, there is a growing demand for a recycled aesthetic. To meet

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this market demand, Avient has developed speckle effects that feature visible dark particles on a white background or white particles on a dark background. These effects can be used with both virgin and recycled polymers," said Laura Carrillo, Senior Marketing Manager Transportation at Avient.

Black packaging or parts coloured with carbon black are unable to be identified in recycling systems using established near-infrared (NIR) technology for sorting. In response, suppliers have introduced alternative NIR-detectable blacks. In Canada, for example, a recent ban on carbon black in single-use plastics for food service is driving a shift to NIR-detectable blacks, said Lisa Cooper, Product Stewardship and Sustainability Manager at **Colortech**. The company recently introduced NIR Black F000196, a low-cost solution with a blue undertone. "We also offer our customers other NIR Black choices based on cost, reflectance, and colour outcome," said Cooper.

Enabling recyclability, such as with NIR-detectable dark and black colours, is one of the top trends affecting masterbatches in the US, said Theresa Patton, Associate Marketing Director for Color & Additives, US & Canada, at Avient. She expects demand for these technologies, such as Avient's OnColor NIR Sortable Black and Dark colorants, to grow in the near future. Also of importance are additives designed to aid recycling and maintain the quality of the PCR stream. For companies seeking to manufacture coloured parts with 100% PCR, Avient launched Rejoin PCR Colorants that can enable PCR to be used as a carrier resin.

Becker points to Ampacet's Rec-NIR Black that can be sorted and also to laser marking masterbatches that allow manufacturers to improve recyclability by replacing labels and inks with a laser mark. Ampacet's new ColorMark is a colored laser marking masterbatch that can be used for decorative effects. In addition to colours and additives that aid recyclability, Becker sees growing demand for masterbatch solutions that improve durability and extend the life of plastic products or packaging.

## Additive changes

As governments and regulatory agencies are increasingly scrutinising additives going into plastics, masterbatch producers are proactively introducing products to comply with potential restrictions. Fluoropolymers, for example, have been widely used in processing aids, but companies are seeking to replace them with alternatives because they are being classified in the category of perfluoroalkyl and polyfluoroalkyl substances (PFAS). PFAS-free processing aid alternatives have been found to work well to eliminate melt fracture, reduce die buildup, and avoid interfering with sealing or surface treatment. Siloxane-free alternatives were also introduced following the European Chemical Agency's categorisation of the short-chain oligomers in siloxanes as Substances of Very High Concern.

Wisconsin, US-based **Badger Color Concentrates**, which was acquired by Kafrit Group in February this year, announced in September that it had transitioned to using only PFAS-free raw materials in its manufacturing facilities. Kafrit's Polyfil (US) and Constab (Germany) businesses introduced a line of

IMAGE: AMPACET

**Ampacet says its ColorMark laser marking technology enables producers to create permanent colour lettering and designs on black plastics**

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PFAS-free polymer processing aids last year.

"With regulations around the world severely restricting or banning the use of PFAS and PTFE, converters and manufacturers are challenged with finding alternatives that can match their self-lubricating performance," said Lauren Lutikoff, Global Sustainability Leader at **Americhem**. She points to the company's PFAS-free EcoLube line, launched in spring 2024 and designed to optimise performance in markets such as medical devices, industrial applications, nonautomotive vehicles, and others.

Other regulatory concerns involve some grades of benzotriazole UV additives that have been added to the European SVHC candidate list, said Becker. She notes that Ampacet introduced UVBLOCK 1496 as an alternative UV barrier; the additive is approved for food contact applications in Europe and the US.

## Carbon footprint

Masterbatch companies are seeking ways to reduce the carbon footprint of their products and processes, and their customers are increasingly requesting sustainability-related data assessed by third-party reporting organisations.

"Colortech is seeing a rise in customer requests centered around sustainability, covering carbon emissions, waste, water, and energy management and accounting," said Cooper. "We participate in CDP [formerly Carbon Disclosure Project] and EcoVadis reporting, driven largely by customer requirements for transparency and progress tracking. While many requests focus on emissions data and resource use, we also see growing interest in formulating with bio-polymers, mechanically recycled resins, carbon-neutral or negative materials, and materials that enhance recyclability, all of which align with industry trends. Overall, the industry's efforts appear to be united toward collaboration, aiming to make a meaningful impact."

The drive for transparent reporting is causing increasing pressure on the masterbatch industry to dedicate extensive resources to provide metrics that are required by customers as well as governments, Becker said. In her opinion, third-party assessment standard ranking tools should be considered with caution, however, because they may not accurately reflect an organisation's efforts.

One challenge to reporting that Becker notes is a lack of carbon footprint data for the wide range of raw materials going into masterbatches. "Some manufacturers provide generic data that they plug into their formulations, but these are, at best, an approximation. These industry-wide numbers should become more accurate as we continue along this journey," she predicted.

"We are always on the lookout for more sustainable materials that reduce our emissions as well as the emissions of both upstream and downstream processes of our suppliers and customers," said Becker. Recycled carbon black is one example. In addition, Ampacet seeks emissions reductions in its own manufacturing processes. "We are now measuring

Scope 1, 2 and 3 emissions data for our facilities, setting goals that are in line with Science Based Target Initiatives and investing in our production facilities to use less water, less energy, and reduce our use of fossil fuels with other alternative energy sources whenever possible," she explained.

In Europe, the increasing requirements for substantiation of sustainability claims is a significant trend affecting the masterbatch market, said Deborah Sondag, Colorant Chromatics Global Marketing Manager at Avient. She explained that the tightening of sustainability claims with the establishment of the Green Claims Directive – which emphasises the need for OEMs to clarify any sustainability claims they publicise – has been one driver. Working with proven methods and third-party certifications to substantiate any sustainability claims is a trend, she said. For example, last year Avient launched its TÜV Rheinland-Certified Product Carbon Footprint (PCF) Calculator.

"Generally, there is a strong appreciation for solutions that can reduce the carbon footprint of products in Europe," said Sondag. "This includes recycled polymer solutions, lightweighting solutions to reduce material usage, processing aids to lower energy consumption, and the incorporation of bio-based content. Customers prioritise solutions that can fulfill product technical and regulatory requirements. Additionally, for certain high-visibility consumer products, aesthetic appeal is also a critical element. Application expertise and guidance are vital in providing effective solutions."

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IMAGE: TECHMER

## Larger demand for smaller volumes

**Techmer PM** sees a trend to smaller masterbatch volumes, driven by specialised applications. In addition, the company said that customers are holding lower inventories, which makes turnaround more important. To meet this need for rapid fulfillment of smaller lot sizes, the company recently opened its Small Lot Center of Excellence in Batavia, Illinois, near Chicago. Orders as low as 50 lb are accepted.

"This is a strategic investment by Techmer with the goal to redefine industry standards in speed and reliability," said Michael McHenry, CEO of Techmer PM, in an April press release. "By leveraging our expertise and resources, we are dedicated to achieving industry leading turnaround times for small lot masterbatch and engineered compound materials, ultimately enabling our customers to accelerate their speed to market."

The company says the centre is equipped with equipment for unique, highly loaded additives and fillers designed to accommodate complex formulas with precision and efficiency. Automated blending and conveying equipment as well as cleaning stations create a safer and more efficient work environment.

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The journey begins with understanding the unique needs of customers seeking specialized masterbatches – whether for automotive, packaging, or consumer products. Close collaboration with Sun Chemical's experienced sales and technical teams from the start allows for a deep dive into customer-specific specifications, discussing everything from color requirements to functional additives. This tailored approach ensures alignment with customer goals and sets the foundation for a successful partnership.

Once requirements are defined, Sun Chemical's Masterbatch Competence Center takes over. Here, concepts are transformed into tangible solutions, developing customized masterbatch formulations tailored to precise application needs. The Competence Center's capabilities – from small-batch testing to prototype production – allows customers to evaluate new formulations. These advanced testing facilities, such as film-blowing and injection molding systems, simulate real-world applications, ensuring every product meets customer standards.

After the prototyping phase at the Masterbatch Competence Center, it is time to move into full-scale production.

Sun Chemical's recently expanded Mixing Plant is at the heart of the mixing step, bringing together cutting-edge technology, automation, and a commitment to energy efficiency. Covering approximately 1,700 square meters of floor space, the plant has been designed to meet the highest demands of modern masterbatch production, supporting both high-volume orders and just-in-time (JIT) manufacturing.

The Mixing Plant has high-speed mixers that ensure reproducible quality, precisely controlling the dispersion and homogeneity of pigments, additives, and polymers. This consistency is vital for delivering the high-performance masterbatches that customers rely on.

To keep up with customer dynamic needs, the Mixing Plant incorporates a KANBAN storage system that optimizes the supply of materials to the production line. This system ensures that materials are readily available when needed, minimizing overstocking while maintaining seamless production flow.

*Above: Sun Chemical's mixing plant features high-speed mixers and the latest in digitalization and automation technology.*

*Right: Sun Chemical's Masterbatch Competence Center can not only produce small quantities, but also guarantee high quality through various technical tests.*

With 16 dedicated extrusion lines and the capability to produce batches ranging from 100 kg to 50 tons, Sun Chemical meets the demand for small and large orders. Sun Chemical's production facilities employs side feed dosing, high-temperature extrusion, and full batch traceability through RFID, maintaining consistent quality across all orders.

Quality assurance from raw materials to the final product is integral at every production stage. Sun Chemical's Masterbatch Competence Center conducts rigorous QC checks using state-of-the-art equipment, including FTIR (fourier transform infrared spectroscopy) and MVR (melt volume rate) determination. This ensures that each batch meets precise color, consistency, and performance specifications.

Quality control and the delivery of the masterbatches ordered are only part of the final step.

The customer's journey continues after delivery. Sun Chemical stands for a partnership beyond the product, which means its team provides robust after-sales support, assisting with technical inquiries, product adjustments, or process optimizations. Whether it is recommending new formulations based on evolving industry standards or providing insights on regulatory compliance, experts remain accessible, positioning Sun Chemical as a long-term partner in customer success.

By aligning resources and expertise with customers, Sun Chemical stands out as more than just a supplier – it is a trusted partner in achieving excellence. From concept to delivery and beyond, Sun Chemical's commitment to quality, innovation, and tailored solutions empowers customers to confidently push the boundaries of what's possible no matter their industry. Together, Sun Chemical and its customers are meeting today's demands and shaping the future of masterbatch solutions.

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IMAGE: CABOPOL

*In response to supply and pricing problems in the antimony market plus growing PFAS restrictions, companies in the flame retardants sector are launching new additives and compounds. By* ***David Eldridge***

# Pressures proliferate in flame retardants

An established feature of the flame retardants (FR) sector is the influence of negative external factors, particularly from tighter regulation, which has led in recent years to restrictions on halogenated FR products. This year, though, pressure has been ramped up further and suppliers of FR additives and compounds have been forced to look for new solutions as China's recent ban on antimony exports hits brominated FR products and the prospect of a clampdown on per- and polyfluoroalkyl substances (PFAS) affects anti-drip ingredients.

Prices for antimony – used in its antimony trioxide (ATO) form as a synergist in BFR additives – had already been hitting record highs when China announced new rules from September that effectively prevent antimony being exported. Prices rocketed as the market tried to deal with the shut-off of the significant supply of antimony from China, which accounts for around half of global mine production. The reason for China's action is geopolitical: it is part of its ongoing trade conflict with the US which shows no sign of easing as the Trump administration gets ready to take control following the presidential election in November.

"Recent pricing hikes for the BFR synergist ATO, primarily due to export restrictions from China, have led to significant pain for our customers," said Matt von Holle, VP of Specialties Product Management at BFR producer **Albemarle**, adding that this is a key focus for the company's research and technology team.

Wesley Hamilton, Chief Technical Officer, said: "Albemarle has already demonstrated that ATO is not required for certain commercially-viable polymer compounds containing BFRs such as SAYTEX 8010 or recently-commercialised SAYTEX ALERO. We find that the next generation polymeric SAYTEX ALERO can actually improve processability while meeting flame retardancy and other key performance requirements."

As the antimony market becomes subject to frantic searching for supplies in North America and other regions, and mining companies acquire competitors or fast track development of new

**Main image: Sustainability is the focus of new FR compounds, the R-Sofiplus range, launched by Cabopol in the wire and cable market**

deposits, some additives companies have been looking at alternatives to insecure antimony. **CAI Performance Additives** has launched ST-FR322 synergist for halogenated FRs, which it says is "an environmentally friendly alternative that delivers exceptional performance and cost savings for a wide range of plastic applications". It is an organic and inorganic complex substance, free from heavy metals, which CAI says is a "compelling alternative to traditional flame retardants containing antimony trioxide, which raise environmental and health concerns".

According to the company: "ST-FR322 shows a powerful synergistic effect when combined with halogenated flame retardants. It effectively replaces antimony trioxide in equal amounts in various plastics, including PA, PBT, ABS, HIPS, PS, PVC, PP, PE, EVA, and more."

CAI said that ST-FR322 achieves the same level of flame retardancy as antimony trioxide. Other features include: reduced smoke production; anti-dripping; improved processing.

The regulatory scrutiny of halogenated products has continued in Europe and North America, leading some companies to develop non-halogenated FRs. But Albemarle says it remains confident that its BFR products are safe and effective polymer additives. As the regulatory pressure continues, Albemarle's commitment to product stewardship leadership has remained. "Our team of scientists employs an evidence-based approach and conducts extensive testing to prove performance and gauge sustainability more holistically," said Kyle Bodine, Senior Director in Research and Technology. "We assess potential degradation pathways of the FR, including hydrolysis, thermal decomposition, photolytic instability, biotransformation, and assess its recyclability and likelihood to leach out after incorporation into the resin."

Gregg Ublacker, Senior Director of Product Stewardship, said: "Historically, non-halogenated FR evaluations have been less rigorous and less scrutinised, but hopefully, this is beginning to change. We continue to see propagation of incorrect assumptions that all BFRs are unsafe and that all non-halogenated FRs are safer. This can lead to regrettable substitution which then may result in less safe products for consumers. As health and safety data are generated for FRs, we need to constantly review the potential hazards and risks and assess how to mitigate these risks to ensure the continued use of the most efficacious and safest product for the intended applications."

Jessica Bowman, Senior Director of Regulatory Affairs, said: "Albemarle continues to engage with regulatory agencies in all geographies, which we do together with our partners including the North American Flame Retardant Alliance (NAFRA) and the International Bromine Council (BSEF). Communication of the science demonstrating safety of BFRs, along with their critical societal benefits, is paramount to Albemarle's mission to be a responsible partner for people and the planet."

On the sustainability front, Albemarle has embarked on a project to conduct product carbon footprint (PCF) analyses of all of its BFRs. "We first completed the PCF for our bromine raw material produced in Magnolia, Arkansas. Compared to phosphorus, bromine has a much lower carbon footprint," said Benjamin Caire, Sustainability Lead, Commercial and Supply Chain. "This translates to a lower PCF for the derivatives. For example, the manufacture of our DBDPE product, SAYTEX 8010, used in electronic enclosures, has lower greenhouse gas emissions compared to BPADP," explained Caire.

In October, **Elementis** announced the expansion of its specialty additives product offerings into plastic compounding applications with the introduction of Charguard organoclay-based FR synergists. These synergists are designed to enhance anti-drip and char formation properties of non-halogenated FRs.

Elementis said the move away from PFAS due to regulatory scrutiny has led to research into alternatives. "With well studied and impressive safety credentials and superior performance properties, the shift has paved the way for naturally derived organoclay to be considered as an alternative synergist option," it said.

Charguard 1000 has a natural white colour and

**ST-FR322 synergist for halogenated FRs**

| | |
|---|---|
| Whiteness | ≥90 |
| Thermal Decomposition Temperature | 360°C |
| Specific Gravity | 2.62 g/cm³ |
| Average Particle Size | ≤4 µm |
| pH | 6.7 |

*Source: CAI Performance Additives*

**Below: Comparison of commercially viable ATO-free formulations in PP showing improved spiral flow mould filling for Albemarle's new SAYTEX ALERO product**

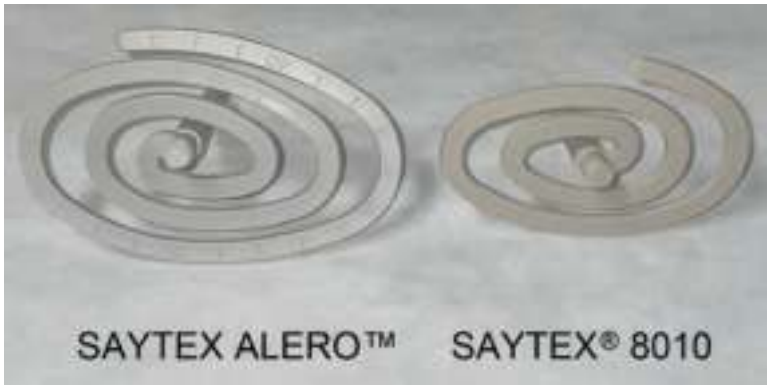


IMAGE: ALBEMARLE

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ultra-fine particles making it suited to consumer electronics and whiteware plastics. The company said: "The reversable shear-thinning properties of organoclay, provide for ease of processing under high solid mechanical stress conditions that are common with processing non-halogenated retardants. These properties combined with an ultra-fine, delaminated platelet structure, help prevent dripping and promote char formation during thermal combustion events and make Charguard 1000 an excellent choice for formulations that require both improved fire safety and a polished, attractive appearance."

Charguard 2000 has been developed for neutral, darker, or opaque plastic compounding applications where colour is less critical. Larger particle sizes make it suited to industrial fire retardant masterbatch applications that require high tensile strength, exceptional elongation to break and ultra-low moisture pick-up properties, said Elementis.

**Tolsa**, another producer of clay-based FR synergists, is targeting the wire and cable compound market with its ADINS Clay and ADINS Fireproof ranges. "These unique additives are being considered as a good component for halogen and halogen-free flame-retardant systems in the wire and cable industry," said Marta Sacristán, Technical Manager, for Tolsa's Functional Additives. "They provide high FR performance, meet today's regulatory standards, and provide the versatility that formulators and end users require."

Some compound companies have been promoting their products this year as "PFAS-free" following announcement of a universal PFAS restriction which would come into force in Europe in 2025 or 2026. **Trinseo** has announced a new offering of FR materials, Emerge PC 8600PV and 8600PR, as well as Emerge PC/ABS 7360E65 resins, manufactured without the use of PFAS or halogenated additives. These are aimed at applications in electronics and electrical industries.

**LG Chem** is also targeting E&E markets with its PC and PC/ABS materials. In August, it said its PFAS-free PC/ABS FR compound, which incorporates recycled material, had received the V-0 rating in the UL94 flame


**Tolsa is targeting the wire and cable compound market with its ADINS Clay and ADINS Fireproof ranges**

IMAGE: TOSAF

**Above: Tosaf's advanced flame retardant lab, equipped with state-of-the-art technology, offers comprehensive testing capabilities to meet a broad range of fire standards**

retardancy test. The V-0 rating is the highest level of flame retardancy performance in the industry.

"The transition to eco-friendly materials, including PFAS-free flame-retardant plastics, will become a global trend. We will continue our research and development efforts to create eco-friendly and flame-retardant materials that prioritise customer well-being and the environment," said Steven Kim, Senior Vice President of LG Chem's Engineering Materials Business Unit.

In addition to PC/ABS materials, LG Chem has successfully obtained UL certification for various PFAS-free flame-retardant materials it has developed, including PC and PBT.

The HVAC (heating, ventilation, and air conditioning) industry is a key market for FR PP and ABS compound producer **Tosaf**. The sector is experiencing significant growth due to various factors, including rising global temperatures, increased urbanisation, and a heightened demand for energy efficiency. "Flame retardants play a vital role in ensuring that the plastic components within [HVAC] systems meet stringent fire safety standards, protecting both consumers and properties from potential fire hazards," it said.

The company's products undergo rigorous testing to pass needle flame and glow wire tests, validating their reliability in high-risk environments. This ensures that they not only meet regulatory standards but also perform effectively under real-world conditions, it said.

"We recognise that each application has unique requirements. Therefore, we offer tailor-made compounds designed to meet specific mechanical properties and flame retardant performance needs. Our team of experts collaborates closely with customers to develop solutions that not only enhance safety but also optimise the overall performance of HVAC systems. This bespoke approach allows us to cater to a wide array of applications, from residential air conditioning units to large-scale industrial systems," said the company.

Tosaf offers PP and ABS non-halogenated FR compounds that meet various UL 94 classifications. Its halogenated FR compounds include: FR PP V2, a halogenated black PP flame retardant compound that meets UL94 V2 standards, suitable for applications where a moderate level of flame resistance is required; FR PP V0, grey base, which meets UL94 V0 requirements, offering enhanced fire resistance for more demanding applications; FR PP 5VA, black base, with a UL94 5VA rating, providing the highest level of flame resistance and suited to critical components that demand superior protection; and FR ABS V0, a halogenated ABS FR compound that meets UL94 V0 standards.

Tosaf said it also offers FR compounds with low carbon footprint values, aligning products with ecological solutions and sustainability goals.

Sustainability is the focus of new FR compounds launched by **Cabopol** in the wire and cable market. The R-Sofiplus range are FR PE grades for medium voltage power cable sheathing, incorporating 30% post-consumer recycled (PCR) content. This development provides a fully formulated natural HDPE solution and achieves a 26% reduction in total $CO_2$ emissions, it said. Additionally, the company offers a non-halogenated FR compound for low and medium voltage sheathing and insulating flexible cables, containing 10% PCR content and enabling an 8% reduction in $CO_2$ emissions. "These compounds reflect Cabopol's commitment to reducing environmental impact while ensuring high safety and performance standards," the company said.

In response to the growth of renewable energy and cable applications in wind turbine systems, solar photovoltaic systems, and electric vehicle charging infrastructure, Cabopol has expanded its product portfolio, production capacity, and technical expertise. The Sofiplus One compound portfolio now includes halogen-free materials for power cables, suitable for curing by e-beam, moisture, or continuous vulcanisation processes. It said these innovations support the durability and performance requirements of cables used in renewable energy systems.

**CLICK ON THE LINKS FOR MORE INFORMATION:**

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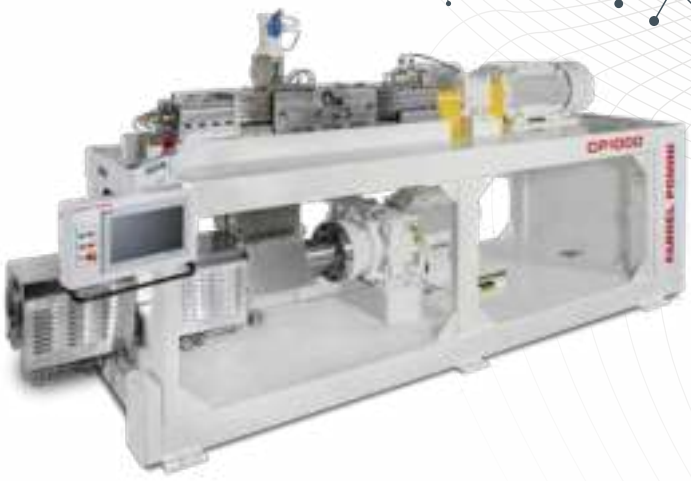

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IMAGE: BRABENDA

# Researching innovation at a small scale

***New equipment in laboratory compounding have features that deal with recycled content, offer easy operation and facilitate formulation and production. Chris Saunders reports***

The plastics compounding industry is firmly placed at the forefront of innovation, responding to challenges and opportunities driven by sustainability requirements, performance, and regulatory demands. Laboratory compounding, which facilitates experimentation and the formulation of customised materials before they are rolled out on a commercial scale, has always played a crucial role and is continuing to make progress. As industries across the globe seek more environmentally-friendly, sustainable and efficient solutions, lab compounding equipment needs to not only keep pace but be a key driver in meeting these constantly evolving needs.

Small-scale extruders, such as the Process 16 twin-screw extruder from **Thermo Scientific**, have enjoyed increasing demand in the growing field of plastics recycling. One of the primary advantages of small-scale extruders is their ability to efficiently manage limited quantities of material. In many recycling scenarios, especially in the initial stages of recycled compound development or when dealing with novel materials, only small amounts of input streams are available. Tom Geilen, Product Manager at Thermo Scientific, said: "The Process 16 twin-screw extruder, with its capacity to process as little as 5 kg to 10 kg of material, is perfectly suited for these situations. This capability is particularly valuable in a university setting, where student projects and feasibility studies often rely on limited samples. The ease of operation, allowing a single person to manage the extruder, further enhances its utility in educational and research environments."

The Process 16 extruder has the ability to produce high-purity plastic recyclates. The precise control over process parameters ensures that the recycled materials maintain a high level of quality, often comparable to virgin plastics. This is crucial in developing closed-loop recycling systems, where the aim is to reintroduce recycled materials back into the production cycle without compromising performance.

The versatility of the Process 16 twin-screw extruder is also noteworthy. It can be used to process a wide range of polymers, including more challenging materials like recycled polyester from textile fabric and foil shred polymer. This flexibility allows researchers to experiment with different types of plastics and additives, gaining insights into their processing behaviour and optimising recycling strategies accordingly. The ability to conduct such experiments on a small scale reduces waste and cost, making the entire research process more viable.

Furthermore, the compact design of the Process

**Main image: The TwinLab series from Brabender allows users to streamline material testing for lab- and pilot-scale setups while optimising the extrusion production process**

16 extruder makes it suited for laboratory settings. Its small footprint allows it to fit into tight places, freeing up valuable space for other equipment and activities. This is complemented by the extruder's user-friendly interface, which simplifies operation and reduces the learning curve for new users, accelerating the pace of research and innovation.

**Eurexma**, a member of Syncro Group specialising in lab and pilot technology, has drawn similar conclusions regarding how equipment is now being used. The company says: "In recent years, the market has seen a growing interest in solutions oriented towards the recycling and upcycling of polymers, as well as the development of compounds based on compostable biopolymers."


IMAGE: THERMO SCIENTIFIC

**Above: Thermo Scientific's Process 16 twin-screw extruder can process as little as 5 kg to 10 kg of material**

At the NPE 2024 show in the US in May this year, it presented its Microex line, a series of benchtop extrusion machines designed for quality control of recycled materials, masterbatches and additives. These machines can simulate different extrusion processes by processing small quantities of material with reduced energy consumption. To further boost efficiency, the Microex line can be equipped with Eyes, Syncro's visual inspection system for in-line quality control of materials.

## Diverse needs

Eurexma says it is currently working in collaboration with various partners in advanced research projects aimed at improving polymer recycling processes and notes that demand for materials with organic fillers, such as natural fibres and by-products from the food and agricultural industry, has intensified. The growing focus on innovative polymers such as polyhydroxyalkanoates (PHAs), which are biodegradable in different environments, has also brought about new technical challenges and extensive laboratory testing is required to find ways to preserve the properties of materials during compounding with other bio-based polymers or fillers. The company is also heavily involved in advanced research for the depolymerisation of PET.

Earlier this year, Thai company **Labtech Engineering**, which counts Tosaf, Clariant, LG and BASF amongst its customers, underscored the industry's ongoing commitment to sustainability with the development of a mini conical single-screw extruder for recycled materials. The company says: "In a world increasingly focused on eco-conscious solutions, we are excited to join the global trend towards recycled materials. Our mini conical extruder and conical screw 16mm, compatible with various downstream units such as blown film, cast film, filament extrusion, pelletising lines, and our new COMBI lines, offer versatility and efficiency in recycling processes. While our current focus is on the mini extrusion line, Labtech Engineering also offers single conical extruders for our larger standard lines."

The mini conical extruder is described as an optimal solution for processing small-scale samples, making it suited for diverse customer needs, including R&D exploring recycled materials, QC ensuring material and product quality, and universities seeking compact and versatile research equipment. It can be used with a wide range of common recycled materials, including PET, LDPE, PP, PA and PLA.

The high channel depth at the feed zone enhances material intake capacity, which is particularly beneficial for recycled plastics of low-density and high volume-to-mass ratio. Additionally, this feature also helps prevent material bridging or clogging, ensuring smooth material flow. The conical design offers versatility through two options: the low-shear screw designed for heat-sensitive materials to minimise degradation; and high-shear screw which is more suited to handling blends and composite materials, ensuring efficient mixing and homogenisation.

## Upgrades and extensions

The lab compounding sector is dynamic and rarely stands still. **Coperion**'s ZSK 18 MEGAlab extruder, which has been established for several years, has recently been extensively upgraded. The company has equipped it with several new functions including: pluggable cartridge heaters instead of hard wired ones which allow for rapid barrel reconfiguration and straightforward cartridge heater exchange; an electrically securable maintenance door on the gearbox lantern which increases operational safety and provides quick access; and feeders that can now be placed on a newly-developed, patent-pending feeding platform. This new platform, which can be moved laterally, allows up to four feeders to be rotated and raised or lowered as needed, providing maximum flexibility and creating enormous advantages in recipe development as feeding can be flexibly located at various points in accordance with process requirements.

As part of the redesign, Coperion separated the mechanical and electrical components and

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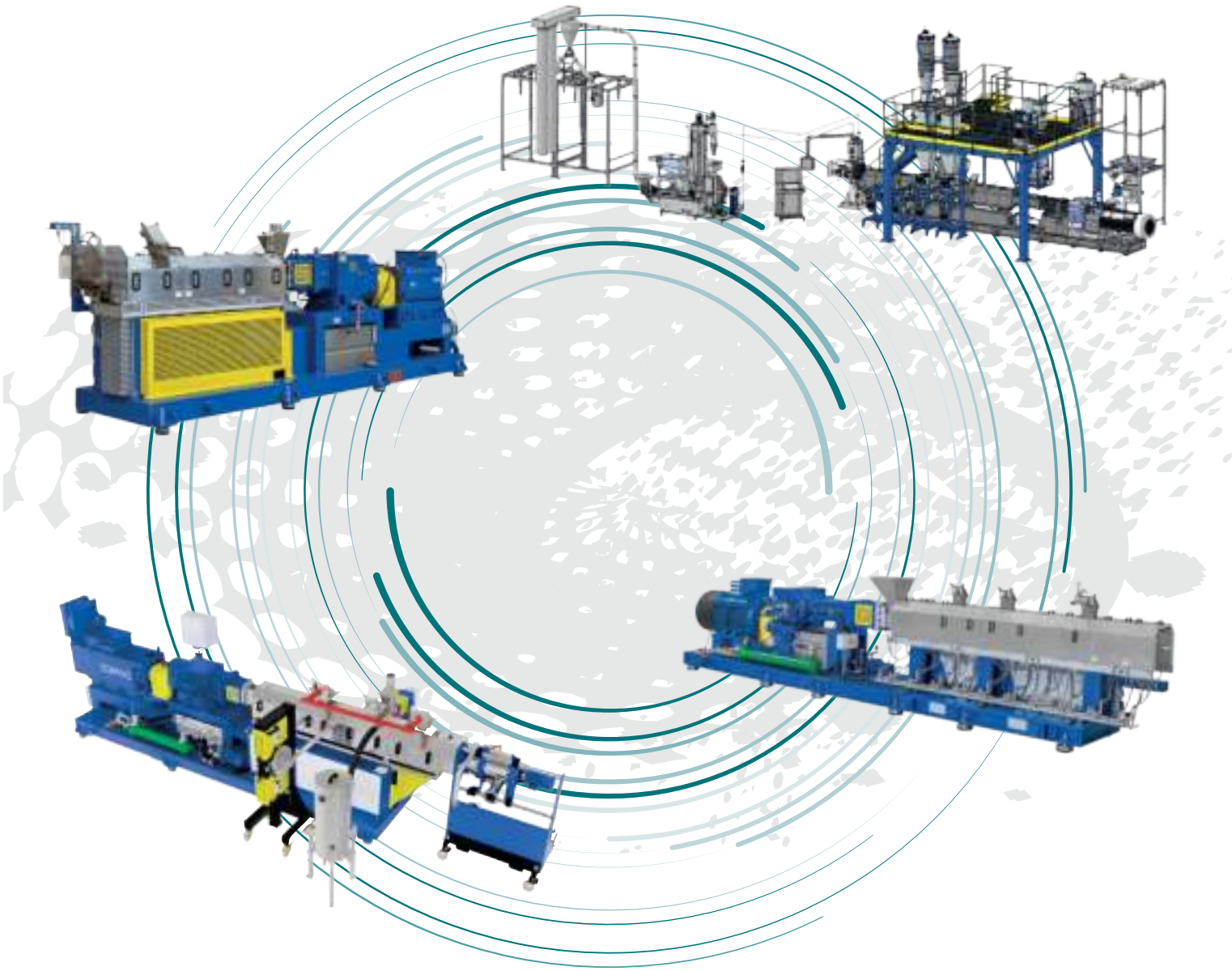

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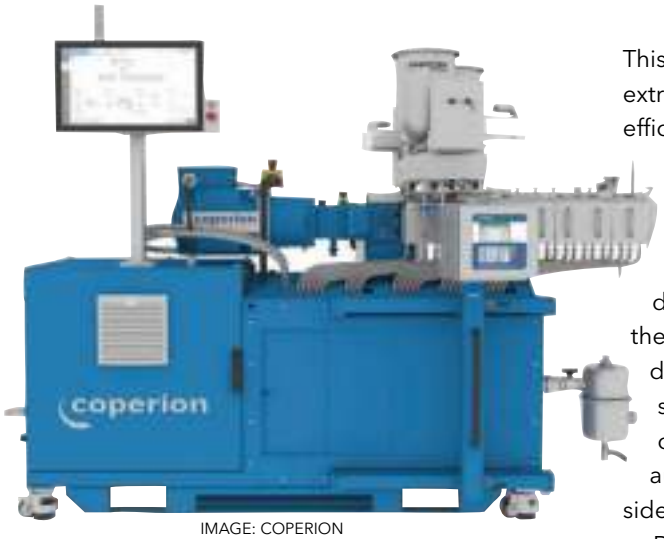


IMAGE: COPERION

**Left: Coperion has added several new features to its ZSK 18 MEGAlab extruder**

mounted the control cabinet laterally onto the base frame, meaning mechanical maintenance tasks can now be performed without an electrician. To increase flexibility still further, the control cabinet is available in assorted designs including as a junction box if, for example, an external control cabinet is necessitated due to ATEX requirements. The design of the base frame itself has also been modified. Along with height-adjustable levelling feet, the cable routing has been optimised to keep the floor around the extruder free of clutter, and all supply lines have been centrally connected to the rear of the machine and distributed inside the base frame to reduce impediments.

Johannes Heyn, Development Engineer with Coperion Research & Development, said: "This optimised ZSK 18 MEGAlab extruder combines proven ZSK series functions and new developments specifically for laboratory operation that make its handling especially flexible and intuitive. This allows us to offer our customers a versatile extruder solution that is characterised by maximum efficiency."

In October, German engineering company **Feddem**, a member of the Feddersen Group, expanded its portfolio to include the FED 18 MTS twin-screw extruder. The company says its design makes it possible to run applications on the smallest scale, making it ideal for research, development, and the production of small samples. The FED 18 MTS system offers all the characteristics of production extruders, and auxiliary units such as FSB side feeders and FSV side degassing are readily available.

Due to the small process volume and the wide range of configuration possibilities, the process section of the FED 18 MTS can be adapted to varying requirements, meaning a stable, reproducible system is quickly realised. Transferring the findings to production extruders can improve processes and optimise production in terms of sustainability and cost efficiency.

## Plug and play

The length of the processing section of the extruder can be extended from 32 L/D to up to 52 L/D in 10 L/D steps without having to modify the frame, the cooling system, or the electrical system, and thanks to 'plug and play' solutions, it can be changed in under an hour of set-up time. The processing section and drive train are mounted on roller guides, and can be adapted to the required length by simply sliding them. The supply lines to dosing units, vacuum pump, and cooling unit, are also pluggable so components can easily be

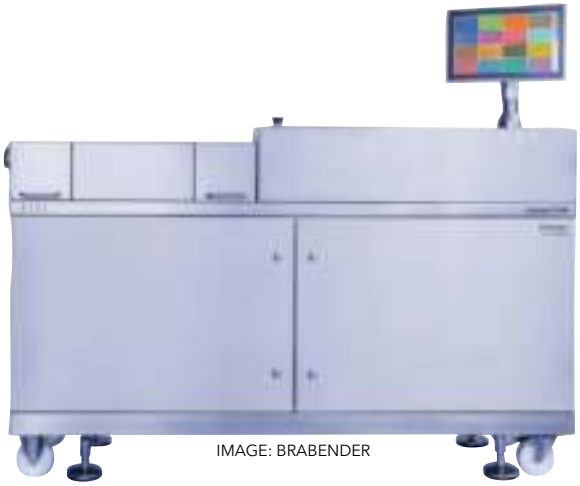

IMAGE: BRABENDER

**Right: Brabender manufactures the TwinLab series of extruders**

disconnected for cleaning or maintenance purposes. For calibration or emptying hoppers, the dosing units can be swivelled into side positions without having to be lifted from their racks, side feeders can be moved between positions on guide rails, and integrated supports above the side feeders round off the compact design.

The TwinLab series of extruders from **Brabender** provides various configurations to process everything from liquids to pellets. The most recent model is the electrically heated twin-screw extruder B-TSE-S 30/40, which has a compact design combining the drive and the processing unit making it the smallest compounding system in its category on the market, according to the company.

To allow users to gain a deeper understanding of the materials they are working with, the latest versions are fitted with MetaBridge operating software which offers cross-platform access to measuring results, letting users access recorded data from any device and location providing up-to-the-minute information and eradicating transcription errors. This data can be exported to colleagues and third-party systems via email directly from the extruder.

## Well-equipped

**CPM** says its Innovation Lab in Lauffen, Germany, is the only test centre in the world capable of running extrusion processes side-by-side using a co-rotating twin-screw extruder and its RingExtruder, which has 12 co-rotating, intermeshing screws. "We have a very well-equipped laboratory," Jörg Mayer-Lutz, CPM Product Manager Sustainable Solutions said. "This allows us to offer a wide range of options to execute trials for our customers."

The Innovation Lab operates extruders in various sizes including screw elements for all types of applications and a sophisticated dosing system, as

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# Automating with AI in the laboratory

Providers of lab equipment are finding ways to harness artificial intelligence (AI) in the quest to boost productivity.

Earlier this year at TestXpo, the International Expo for Materials Testing, **ZwickRoell** introduced ALEX (Automated Lab Expert), an automation solution said to be as compact as it is cost-effective. Specially designed for small series of ten specimens or more, ALEX automates tensile and flexure tests, freeing up valuable time in the testing lab.

The robotic arm is easy to retrofit and requires no more space than a manual operator, the main advantage being that it automates testing and autonomously performs tensile tests according to ASTM D638/ISO 527.

The company says users can benefit from reproducible results and the reduction of operator influences, a known hinderance with manual testing. It is easy to switch back to manual testing at any time if required, and the robotic arm's parked position ensures unrestricted access to the testing machine.

"With ALEX, we are revolutionising laboratory automation by enabling maximum efficiency with minimum space requirements," said Jakob Brodbeck, Business Development & Product Manager Automation at ZwickRoell. "[It] is the perfect solution for laboratories looking for automation to elevate precision without sacrificing flexibility."

well as downstream equipment such as an underwater pelletising system, a strand pelletiser, a hot melt cutting system, and various filtration systems. "With our lab, we can run tests to design the layout of a new extruder, to gather data for scale up or to optimise our customers' existing processes," added Mayer-Lutz.

CPM's latest development is the High Output SideFeeder (HOSF), a patented device for compacting materials such as talc, silica, or other powdery substances, while they are being fed into the extruder, which allows a significant increase in the filling grade of the melt. "We can simulate the customer's production conditions and evaluate the optimisation potential with the HOSF, a solution for many bottlenecks in our customers' production processes," Mayer-Lutz noted.

**Epolin**, a US producer of UV, visible, and NIR absorbing dyes, has expanded its capabilities with the addition of a second research and development compounding extruder. This enables the company to increase its sample productivity and speed to market for Luminate products, ready-to-mould thermoplastic pellets formulated with Epolight dyes compounded directly into the polymer resin. The solution eliminates the need for customers to manage dye powder loading or dilute master batches, allowing them to focus solely on moulding which simplifies the process and improves consistency. The new extruder features advanced technologies and monitoring systems, enabling the company to explore new dye chemistries for both existing and novel polymer solutions.

Earlier this year a collaboration known as KonDuPound, part of a ZIM project for small and medium-sized enterprises (SMEs) funded by the German Federal Ministry for Economic Affairs and Climate Protection, saw scientists from the **SKZ German Plastics Centre** spend time on site at mechanical engineering company **Entex** in Bochum. The reason for their presence was to conduct tests on the company's laboratory extruders to help develop a process for producing highly conductive thermoset compounds with subsequent direct extrusion of bipolar plates. At the time of writing, no other information had been made available.

**Below: CPM's Innovation Lab in Lauffen, Germany**

IMAGE: CPM

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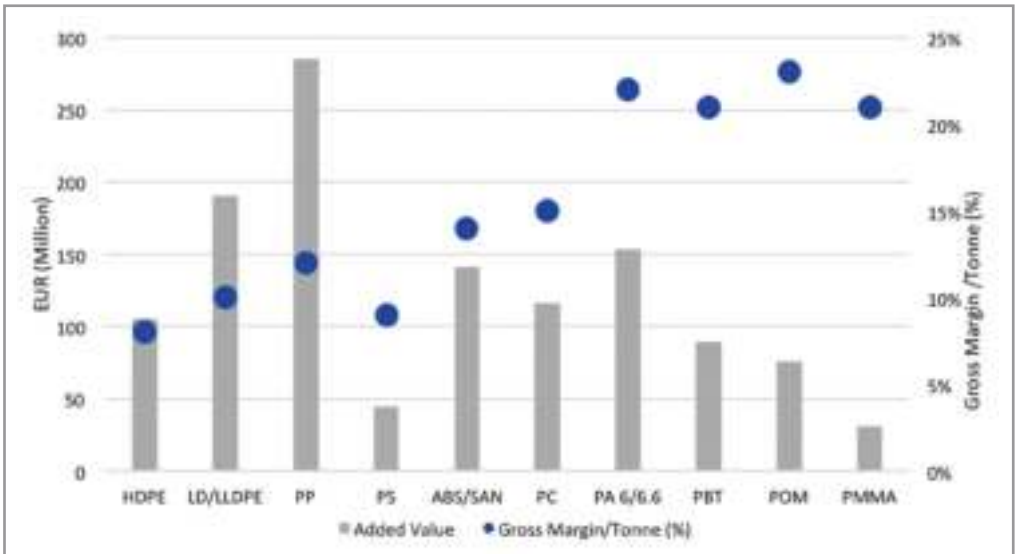
# Distributors increase profits in harsh market conditions

**In polymer supply, Europe is increasingly becoming a distributors' market, writes AMI Consulting. Producer partnerships are key to success, the consultancy says in this article, based on its new market report.**




**Value added by distribution in the EU in 2024 (€ million)**
***Source: AMI 2024***

During the past three years, the European polymer distribution industry has been facing unprecedented challenges, including a pandemic, the Russian war in Ukraine, disruptions in logistics brought on by the Red Sea crisis and the unrest in the Middle East. In addition, there has been a notable surplus in the plastics market in a number of polymer categories, most notably polyolefins.

Competitive pricing and excess supply resulted from increased manufacturing facilities, particularly in the US, and a decline in the market for consumer durables. In the meantime, rising energy costs and competitive imports, particularly from the US and Asia, put pressure on prices and margins, posing a challenge to European producers.

Within this complex environment, the polymer distribution industry has managed to remain strategically important in the polymer industry value chain. In 2023, over 4.6m tonnes of polymers were distributed throughout Europe, making up around 17% of the total demand. Polymer distribution generated revenues of over €10bn, with an added value of €1.2bn (27% more than in 2020). Polymer distributors have demonstrated that polymer distribution is still a profitable industry by making use of industry dynamics to increase profits despite the constraints presented by the current situation of the market.

## Partnerships

These days, the industry is characterised by the rise of distributors collaborating with overseas polymer producers. During the past few years, the industry has seen a significant growth in imports from the US, Asia and the Middle East. Long-term importers into Europe have been strengthening their relationships with local distributors and delivering larger-than-expected volumes to them.

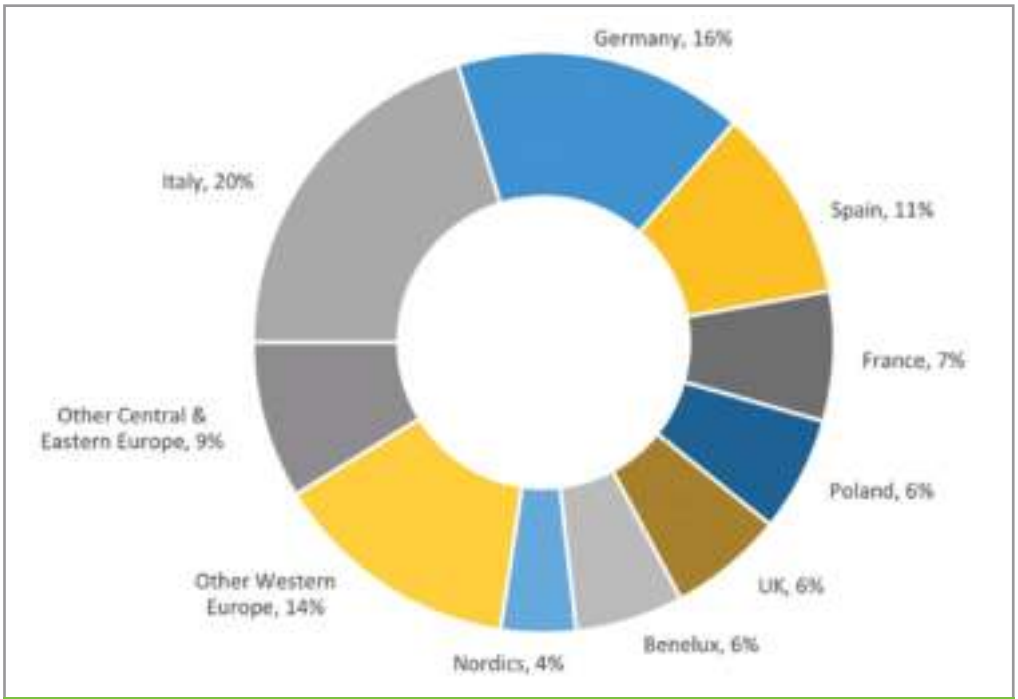
Since there is more room for their material in Europe due to the growing imbalance between supply and demand for polyethylene (and soon, polypropylene as well), these suppliers have a strategic interest in the continent. Europe is increasingly becoming a distributors' market, as European producers in difficult circumstances seek to reduce complexity while overseas producers find in local distributors precious allies to place their material.

In 2023, Italy led the sector in terms of distribution sales with a market share of almost 20%, thanks also to the distributors' activities linked to imports. Germany followed with a 16% share, while Spain's robust distribution sales granted the country third place in the ranking. Similarly to Italy, the increasing desire of foreign producers to establish themselves in the continent contributed to place Spain in the top three.

## M&A activity

Due to rising competition and low demand, M&A activity is still very much occurring in the European distribution sector. Larger, more resilient companies are typically the result of industry consolidation, as they are better equipped to handle market fluctuations and seize expansion possibilities. Achieving economies of scale, growing market share, diversifying product offerings, and enhancing competitiveness have been the primary force for consolidation. Nonetheless, the significance of transactions carried out as financial investments – especially those made by private equity firms – is growing. ❯

Despite this wave of consolidation that started around ten years ago, small and medium-sized distributors are not doomed to disappear. Due to their success in specific areas, countries, and niche markets where they can effectively compete, small distributors have always had a position in the market. Smaller distributors are more likely to provide individualised service and are better suited for smaller customer bases. Distribution activities in Europe are still frequently carried out on a country-by-country basis, with distributors keeping representative offices in the countries where they have significant sales. Local service and loyalty will continue to be important factors taken into consideration by industry players.




**Polymer distribution in Europe – share of sales volumes by country in 2023**
***Source: AMI 2024***

## Pan-European players

Having said that, it is undeniable that the pan-European distribution model defines the structure of the market. Resinex, Biesterfeld, Albis, Nexeo Plastics, Ultrapolymers, Interpolimeri, Hromatka, Snetor, Meraxis and Chemieuro currently lead the European market with a combined market share of about 55%. Looking ahead, the larger distributors are expected to continue increasing their market shares mainly by acquisition, while financial stability will become an even bigger factor in their success.

Overall, conditions remain unstable and outcomes are hard to foresee, with players constantly seeking to differentiate themselves through product quality, technical expertise, and value-added services. In the next five years, polymer distribution sales are estimated to grow slightly above polymer demand at about 2% per year. The sector is expected to slowly recover from the current tumultuous phase characterised by an unparalleled volatility, a lack of activity in the market, imbalance between demand and supply as well as geopolitical tensions.

## Recycled material

The European polymer market is also challenged with the task to merge its environmental agenda with the need for maintaining and enhancing competitiveness. Demand for recycled material is still rather contained, but European polymer distributors are well aware that recycled materials will eventually pick up pace despite the challenges related to waste collection and end-to-end traceability. The challenge ahead for the distribution industry is to understand where it fits in this segment and how the distributor can add value to the supply chain on behalf of the customers.

■ AMI Consulting has published the ninth edition of its authoritative report *Polymer Distribution in Europe*. The research, which was released in October 2024, gives investors and industry participants a thorough grasp of the competitive challenges, market dynamics, and industry development scale.

The report is the result of an extensive research programme, providing a detailed independent assessment of the polymer distribution industry in times of high uncertainty. AMI Consulting has been monitoring and analysing the trends in this industry for over 20 years. Over the previous eight editions, this study has been evolving into the most comprehensive analysis of polymer distribution currently available on the market and represents an essential guide for industry players as they optimise business activities and plan future investments.

This study highlights the development of the market for polymer distribution over the five years from 2018 to 2023, how it is responding to global volatilities, the implications of increasing imports, and how the market is likely to develop over the next five years to 2028.

Details of *Polymer Distribution in Europe 2024* can be found **here**.

For further information please contact Astrid Della Porta at AMI Consulting, email **astrid.dellaporta@amiplastics.com**.

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The November issue of Compounding World magazine has a cover story that looks at improvements in bio-based compounds, while other features are on PVC recycling, mixer technology, and black and white pigments/ masterbatch, plus a TaipeiPLAS 2024 review.

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**Compounding World October 2024**
The October 2024 issue of Compounding World explores the world of graphene and carbon nanotubes, reports on new additives for recycling and looks at developments in alternative compounding technology.

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**Injection World November/December 2024**
The November-December issue of Injection World magazine has a cover feature on the growing availability of digital aids to production in injection moulding, while other features cover developments in hot runners and materials handling. Plus there is a Fakuma 2024 review.

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**Plastics Recycling World November/December 2024**
Plastics Recycling World's November-December 2024 edition shows how in-line data can be used to correct imperfect PCR plastics in articles on colour and melt flow, while non-conventional PET recycling processes are also covered.

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**Pipe and Profile Winter 2024**
Pipe and Profile Extrusion's Winter 2024 edition has a cover feature showing how R&D is helping wood-plastic composites continue to improve, while other features are on large-diameter pipe, materials handling products and PVC additives.

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**Film and Sheet November-December 2024**
In Film & Sheet Extrusion's November-December edition, the cover story reports on the views of thin wall packaging experts, while other features are on melt filtration systems, advances in foamed sheet and the latest stabiliser products.

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| **24-28 March** | Plástico Brasil, São Paulo, Brazil | www.plasticobrasil.com.br |
| **15-18 April** | Chinaplas, Shenzhen, China | www.chinaplasonline.com |
| **6-9 May** | Moulding Expo, Stuttgart, Germany | https://www.messe-stuttgart.de/moulding-expo |
| **7-8 May** | PlastTeknik Nordic, Malmö, Sweden | www.plasttekniknordic.com |
| **8-10 May** | RePlast Eurasia, Istanbul, Turkey | www.replasteurasia.com |
| **14-15 May** | Compounding World Expo India, Mumbai | www.compoundingexpoindia.com |
| **14-17 May** | Plastics & Rubber Thailand, Bangkok, Thailand | www.plasticsrubberthailand.com |
| **20-23 May** | Plastpol, Kielce, Poland | www.targikielce.pl/en/plastpol |
| **27-30 May** | GreenPlast, Milan, Italy | www.greenplast.org |
| **3-5 June** | UTech Las Americas, Mexico City | www.utechlasamericas.com |
| **4-5 June** | Textiles Recycling Expo, Brussels, Belgium | www.textilesrecyclingexpo.com |
| **8-15 October** | K2025, Dusseldorf, Germany | www.k-online.com |
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| **10-11 December 2024** | Recycling Flexible Packaging, Vienna, Austria |
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| **20-22 January 2025** | Thermoplastic Concentrates Forum, Tampa, FL, US |
| **17-19 February 2025** | Polyethylene Films, Tampa, FL, US |
| **25-26 February 2025** | PVC Formulation, Cleveland, OH, US |
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