

GROWTH WORLDWIDE

'Sustainable', 'green' and 'environment-friendly' are buzzwords heard everyday in the world of paints and surface coatings. So it is not surprising that the content of bio-based materials in formulations will inevitably increase. The proportion of bio-based solvent alternatives, too, is set to grow by 2020. By Damir Gagro.



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Society is becoming ever more environmentally aware as sustainable products and solutions start to encroach on both public and private perceptions. There is huge interest in renewable raw materials. And, as in many other industrial sectors, this is setting the agenda for the paints and surface coatings industry.

Many paints and surface coatings bearing labels such as “environmentally friendly” and “eco-friendly” are already available on the market. And it is true that bio-based or renewable raw materials are increasingly finding their way into product formulations. However, their content is usually small and the number of bio-based products itself is not exactly unmanageable. As for natural dyes, their renewables content is high, but not all formulations are composed entirely of bio-based raw materials.

The development of “green” products currently features prominently across the paints and coatings industry. “The industry is working on solutions to further cut down on the use of hazardous and, in some cases, toxic chemicals,” says Dr. Idoia Etxeberria, Technalia. “It’s also paying closer attention to life cycles in its environmental impact assessment. Green chemical technology is set to take on a greater role in the chemical industry for renewable solutions,” adds Etxeberria, who was involved in the European ECOBIOFOR (Ecopaint Bio-Based Formulations) project for the development and production of bio-based solvents.

BIO-BASED SOLVENTS IN 2015: 2.6 MILLION TONNES AND EUR 4.78 BILLION

Paints, surface coatings, printing inks and adhesives are the main outlet for solvents, with a share of just under 60%. The European Solvents Industry Group (ESIG) says that more than 5 million tonnes of solvents are consumed in the European Union every year. Only 630,000 tonnes, or less than 13% of the total, is bio-based. It’s a similar picture at the global level. Isaac Preamsingh, who authored a market study of bio-based solvents for market research company Frost & Sullivan, estimates that global market volume in 2015 was 21.6 million tonnes. He says that bio-based solvents account for 12% of the total market. That translates to a volume of about 2.6 million tonnes and sales worth EUR 4.78 billion.

The picture for consumption of bio-based solvents is a familiar one. According to the study, Asia-Pacific accounts for the lion’s share, at 1 million tonnes or about 39% of the total, with 700,000 tonnes accounted for by Europe, 500,000 tonnes by North America and 200,000 by South America. The remaining 200,000 tonnes are spread across other regions, namely the Middle East and Africa.

Demand for bio-based coatings is on the rise. Volumes of bio-based solvents are following a similar upward trajectory. The most important or largest outlet for bio-based solvents is paints, surface coatings and printing inks, with a 40% share. Etxeberria forecasts that Europe alone will account for 1 million tonnes by 2020. Preamsingh agrees: he predicts that Europe will enjoy an annual average growth rate (CAGR) of 8.8% over the period 2015 to 2020. The corresponding figure for North America will be 7.3% while South America will post double-digit growth of 10% over the same period. Growing even faster again is the demand for bio-based solvents. The author of the Frost & Sullivan study is positing annual growth of 11% for the Middle East and Africa, and as much as 12.6% for Asia-Pacific.

MARKET GROWTH PREDICTED TO HIT 4.1 MILLION TONNES ON SALES OF EUR 7 BILLION

Should these predictions come true, the market in North America would grow to 750,000 tonnes. And demand in South America in 2020 would then stand at 300,000 tonnes, as would consumption in the Middle East and Africa. Asia-Pacific would expand its share to just under 43% of the total volume of 4.1 million tonnes, with consumption forecast to be 1.75 million tonnes.

Asia-Pacific, Europe and America are the key markets being targeted by large-scale investments in bio-based solvents. Environmentally compatible alternatives to mineral oil-based solvents are increasingly in demand: while this is due not just to regulatory requirements, the latter nonetheless remain the main driver for new, environmentally friendly advances. The corporate research and development fraternity is focusing its activities on technologies that will enable bio-based solvents to be produced cost effectively. Preamsingh believes that Europe and North America will lead with regard to innovation. He expects technology transfer to the

Asia-Pacific region within the next five years because production costs there are lower and he is anticipating further improvements and optimizations in the production process which will lower production costs by a further 2.6% during this period. Consequently, he is of the opinion that annual sales value will grow by 7.6% on average. By 2020, the forecast's target year, sales will then come in at just under EUR 7 billion.

GOOD PROSPECTS, BUT CHALLENGES REMAIN

Growing regulatory pressure and rising public awareness surrounding issues such as environment and health are stimulating demand for paints and surface coatings that have little or even no solvent content.

Although the prospects are good, Etxeberria points out that there are still major challenges to be overcome before alternatives based on renewables will be able to compete with petrochemical products on an equal footing. For one thing, he says, there is a lack of available infrastructure and, for another, there are difficulties with implementing investments and finding investors. And then there are still technical hurdles to be overcome: one of the major obstacles, given that petrochemical products are usually much cheaper, is being competitive on costs.

However, Etxeberria expects that concepts with a greater focus on sustainability will spur greater demand for environmentally compatible products. He also notes, though, that sustainability is already a big ticket item for the coatings and printing inks industry. For Etxeberria, product sustainability and pricing are key to driving demand for bio-based solvents and bio-based paints.

Adri van der Waals, DSM Coating Resins, is a little more critical in his assessment. "The paints and coatings industry is very much driven by regulations. Many products which could be categorised under the head-

ing "responsible consumption" have already moved on to the next stage. Diapers, electric power generation and vehicles are just some of the areas where the bio-based content can at times be quite high. The coatings industry, though, is failing to exploit the potential. Van der Waals is convinced that the availability and costs of bio-based materials should be seen as short-term challenges that will be overcome when demand starts to pick up. "If we choose the raw materials carefully, we can also avoid getting into competition with the food industry," he says. "Over the decades, the paints industry optimised the use of fossil fuels. I see no reason why this cannot be done with bio-based materials as well." He illustrates his point with the following example. Alkyd coatings with a substantial bio-based content have been available for many years. However, they suffered when used in outdoor decorative paints or for industrial coatings because the demands there are high. So far, there have been no bio-based binders available for high-performance acrylic or urethane systems. "Our new 'Discovery' acrylic binder is plant-based. We are seeing great demand for such solutions on the market," he says. While this statement refers to binders and not solvents, it shows that work is proceeding on bio-based alternatives and that these alternatives are also in demand on the market.

"If you were to remove alkyd systems from the equation, there would be no market for bio-based coatings at the moment. But a revolution is coming. The only unknown at present is how fast that revolution will take place," he says. Paints and coatings can make a significant contribution to a low-carbon economy. For van der Waals, all markets and application fields have the potential to switch from conventional to bio-based systems. He believes that markets which are either very innovative or have short product life cycles make ideal candidates for this. ◀