Waterborne biobased coatings

From the point of view of polymer manufacturers to the coatings and inks market, there are several ways to improve business sustainability. Some examples are reducing water usage, greenhouse gas emissions, net waste, and non-renewable energy consumption during manufacture or transport.

The long-term effective route to become truly sustainable is to approach via new product developments that would include all aspect of innovation: the research of new sustainable raw materials and polymers, the measurement and development of performance applied to final materials, partnership with customer, and end-users for innovative useful solutions for final market and brand.

How are the Specialty Chemical Manufacturers for the Coatings Industry addressing current issues in order to improve sustainability?

As surfaces are boundaries exposed to external agents that, in some cases, can be extremely harsh and challenging, they are also the gateways through which we perceive the objects we use in our everyday life. Whether it is aesthetic appearance, durability, corrosion protection, or barrier properties, the right treatment on surfaces can boost these characteristics.

The coating or surface treatment is one of the smallest component of the final product. Surfaces are generally coated from minimum of 5 g/m^2 to maximum of 100 g/m^2, depending on the type of substrate, however they impart essential sustainable attributes. In all materials or substrates that we touch everyday these are superficial coatings whether it is paper, textile, wood, metal, or plastic.

At Lamberti from Gallarate, Italy, The Surface Treatment Division is fostering their path towards sustainability and circular economy by moving in four main directions of waterborne polyurethane and acrylic polymers development. These are used as coatings, or in adhesive, or rheology modifiers and crosslinkers.

Performance: higher durability of goods.

Durability is an added value for a coating, especially when is necessary to protect everlasting surfaces with specific properties like chemical resistance, physical properties, abrasion resistance, and adhesions. This is apparently in contrast with biodegradability – degradation of the polymer during a specific period of time.

The knowledge of the performance required over the life-time of the final object permits us to design the waterborne polymers with more sustainable attributes. Thus designing for the right purpose.

• Biobased content: it is possible to increase the renewable raw materials content in waterborne polyurethane and acrylic emulsions without decreasing the performance. Biobased content of up to 70 % can be realistically achieved however the limitations today are related to the relatively new biobased supply chain that has limited capacity. The majority of suppliers are still at pilot or initial industrial scale, and consequently with higher prices.

The focus for the coating industries is to get biobased raw materials without affecting the food chain, and this trend is really in progress with new technologies at industrial scale today.

The biobased content at product level could be measured, for example using the C^{12}/C^{14} analysis (biogenic carbon content according to ASTM D6866) in order to express the content of renewable carbon present in the waterborne polymer sold to the markets.

Waterborne products.

Lamberti's aim is to reduce the usage of volatile organic compounds in coatings and they continuously focus on the reduction of cosolvents and Volatile Organic Compound (VOC) to optimize the performance of superficial effects.

Process optimization:

Another important factor is the constant improvement of industrial processes with the aim to reduce the consumption of energy, water and air emissions, improving process efficiency, and related sustainable impact.

All four directions confluence in analysis of product sustainability, by emissions (Product Carbon Footprint) and by assessment (Life Cycle Analysis) on final products and products for end-users.

Thanks to their consolidated expertise and passion for collaboration, Lamberti supplies a complete range of ingredients for the coating, inks & finishing industries:

- A full range of innovative waterborne polyurethane Esacote® and Rolflex®, UV curable polyurethane, acrylic-urethane hybrids, and acrylic dispersions for soft and hard substrates;
- Fully reacted waterborne polyurethane microspheres (Decosphaera®) suitable for solvent, waterborne and UV 100 % system used as polymeric matting agents to enhance scratch & burnishing resistance and slip control. As well as fashion deco paints with pigmented coloured Decospharea®;
- Synthetic (Viscolam®) and natural (Esacol® and Carbocel®) rheology modifiers to control the viscosity of formulations during production, storage. and application.
- Natural and synthetic solvent based and waterborne waxes (Adiwax) to control and improve gloss, scratch. and slip for multiple surfaces. Special additives & auxiliaries (e.g. dispersing & wetting agents, defoamers, plasticizer. and crosslinkers).

By:

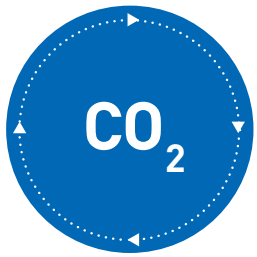
Gabriele Costa
Global Product Manager
Lamberti
Galarate, Italy

Moreover, with a dedicated team of experts, the Italian company is pleased to support customers in the development of waterborne ink & digital ink for inkjet printing.

They offer renewable biobased solutions for several coating application on synthetic material, textile for printing and finishing, for natural leather, plastic and paper coatings, wood and metal coatings.

The key challenge is to replace the demand for fossil carbon by alternative sources;

- Vegetable
- Sustainable Biomass
- Sustainable Oil extracted
- Carbohydrates
- CO_2
- Recycling



https://surfacetreatment.lamberti.com

BIOBASED WATERBASED POLYMERS

- Coating, Crosslinkers & Adhesives
- Additives for surface treatment

SURFACANTS AND FATTY DERIVATIVES

- Not made by EO and PO
- Biodegradable
- Low irritation
- 100% Biobased

RHEOLOGY MODIFIERS

- Carbohydrates feedstock
- Hydrocolloids
- Cellulosics