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ANALYSYS OF THE CURRENT STATE AND TRENDS IN THE DEVELOPMENT OF PRINTING PACKAGING AFTER THE RESULTS OF THE EXHIBITION VIRTUAL DRUPA 2021

The paper reports on the results of the Drupa 2021 trade fair as the main event for printing technologies which was held in Dusseldorf, Germany from 20 to 23 April 2021. The main task of this article is to assess the current state of the packaging industry according to the results of the international conference Drupa 2021.

Keywords: Drupa 2021; biodegradable packaging; technology of production of packaging; Flexographic printing; ecology; packaging recycling.

Introduction

Previous Drupa 2016 reported about excellent business deals, an outstanding climate for investment, a great number of extremely promising technologies and a positive spirit for the global print sector. It focused on topics with potential for growth such as 3D-printing, functional printing, packaging printing [1].

But global pandemic situation in 2020–2021 years made a lot of corrections.

Meanwhile, a 2019 report by the Centre for International Environmental Law (CIEL), Plastic & Climate: The Hidden Costs of a Plastic Planet, suggests that petroleum-based plastic lifecycle accounts for a huge amount of greenhouse gas emissions (GHG). The methods of disposing common plastics, either by landfilling, incinerating, or recycling, have leave behind huge carbon footprints.

Even with the pandemic last year, Bangkok was reported to have generated waste increase of 62 % compared with 2019. Thus, with Covid-19 and lockdown policies, consumers resorted to more online shopping and food deliveries, leading to more waste.

The food packaging sector in Asia is stacking up to growing market demand for sustainable solutions and to achieve the global carbon neutral goals. In 2019 manufacturers were developing strategies to capture growing market preference for sustainable packaging with more recyclable or compostable plastic materials [2].

Packaging production and the printing industry are closely inter-

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mingled. Both of them are full of innovations and technical solutions for increased efficiency, more automation and a higher professionalization. And both are promising application fields for some of the most modern technological innovations: robotics and artificial intelligence. Thanks to both technologies, the recycling sector is on the verge of a total transformation. In 2019 the first recycling robot in action was presented [3].

There is no answer to how to make the best solving for all packaging problems. There are a lot of different recycling arrangements all over the world. In one, packaging can be recycled, in others, there is no such a possibility. Purpose edicts substantial influence. But still the main purpose of packaging is to protect goods. That's why this kind of printing products should be made with least possible of materials. Sustainability means it.

The variety of components need to be based on the functionality and persistence of the selected item. The wrong or right answer doesn't exist [4].

Methods

Due to Drupa 2021 report, the top 5 exhibiting nations are Germany, Japan, Italy, China and Great Britain. Businesses of the all types of printing and production were participating. Among them were as well-known global companies as young companies. Even encouraging start-ups. Approximately 30 percent of exhibitors which presented the full product chain the first time. These provided vital stimuli for tapping into new potential, alongside the comprehensive conference program with an additional 130 presentations in the context of five special forums, focusing on key issues as well as global megatrends and their impact on the industry [5].

The structure of the exhibition was very clear and divided on such directions:

1. Prepress, print.
2. Premedia, multichannel.
3. Post press, converting, packaging.
4. Future technologies.
5. Materials.
6. Equipment, services, infrastructure.

This trade fair demonstrated innovations and the high level of the development of all printing industry. The main all-around trends will an increasing effect on development in the printing industry. Among them are: the platform economy, circular economy, connected consumers and artificial intelligence.

Different megatrends have been shown at Drupa. Special forums 'Hot Spots' included the next branches: drupa cube, touchpoint packaging, drupa next age, touchpoint textile and touchpoint 3D fab+print. They gave a possibility to share personal experience between the participants and speakers in order to transfer knowledges. Advanced solving has been showed in different branches and at the companies stands.

Drupa cube, the conference and event program focused on printing technologies innovations and the diversity in other industries. Such technologies as printed electronics, digital printing, creating multichannel applications were shown and their connection with packaging was clarified. From the other hand, Drupa cube showed how to

get rid the gap between brands, printing industry, creative agencies. Speakers demonstrated the innovative way of thinking which can lead to modernization of the all industry in the nearest future [6].

Drupa next age is the special show, which gave a possibility to announce new ideas, technologies, products, services, strategies. Future technologies discussions and promising background exchange between participants made the Drupa next age one of the most exciting events [7].

Production of packaging is one of the most considerable in the all printing industry and have a colossal gain ability. The market importance was shown in Touchpoint packaging forum. The future of packaging design industry was presented by Packaging Design Association (EPDA), production of packaging by leading companies: BOBST, HEIDELBERG, AGFA, HP and others.

EPDA concentrated on the global trends that describe population needs and how it can effect on the future of packaging and new reasonable solutions. The most important among them are solutions that cut down disastrous environmental impact of the packaging [8].

The covered the industry's entire range and included presentations on state-of-the-art technologies as well as best practices. For the first time, the VDMA Additive Manufacturing Association will be responsible for content design and implementation of the lecture program [9].

The goal of the touchpoint 3D fab+print forum was to introduce to the participants not only special technologies, but also their conveniences for the production of different mechanical pieces, alternative element and present them and perspective potential of supplement systems. One of the topics organizers were focused on was the automation and networking of additive process chains.

Digital textile printing and its perspectives was presented on Touchpoint textile. It congressed a lot of companies from different branches, which are connected with this field. In a future, it will help them to create collaborations, new product, projects and construction suggestions, which can be united into great system.

The leading organizer of the touchpoint textile forum The German Institutes for Textile and Fiber Research (DITF) and other partners from different businesses demonstrated a full production chain from the consumer to the ready product [10].

Results

A lot of information about the new opportunities in alternative channels and e-commerce post COVID highlighting inspiring examples as well as business, design and packaging challenges was given.

One of the main goals was learn how to achieve greater productivity with innovative color management while reducing costs at the same time.

The need for biodegradable and recyclable packaging is quite large today. In the developed countries, most disposable packaging is made from such materials. And Virtual Drupa proved it.

The circular economy has emerged as an overarching policy theme, which is likely to guide sustainability

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policies and practices in the year to come. The concept will mandate actors in the private sector to fundamentally, think differently about product design. Concepts such as sustainable supply chain management, extended producer responsibility and life cycle management will become imperatives, rather than option. Companies, which fail anticipating these developments are likely to compromise their competitiveness in a globally changing world.

Discussion

How to transform challenges into opportunities for the future of flexible packaging?

Embrace opportunities. Making new sustainable solutions is possible:

— Ultra high barrier full paper solutions;

— Recycled materials back in the chain;

— Machine and process optimizations;

— Compostable/biobased solutions;

— Recycling the unrecyclable.

Many solutions are invented to lessen waste in order to reduce negative influence of packaging to the environment. BOBST company offers a lot of innovative solving. They have a definite influence on sustainability. The best are: systems of quality control, technologies of printing and advanced monomaterials which helps to boost the ability of packaging to recycle. Sustainability is one of the BOBSTs main goals so the company created a series of cutting-edge decisions that should make a positive influence on the production chain without modifying the instant workflow [11].

Talking about printing process, there are ways to make sustainability within the process:

— Reduced ink consumption;

— Reduced leftovers and waste;

— Reduced water and solvent for cleaning.

Based on comprehensive Better Human concept, the members of the Print City Alliance showed how environmental targets and outstanding packages can be combined with high-end decoration. It all starts with plastic-free design of the boxes, continues with sustainable products (substrates, inks, varnishes, iriodines, thin layer decorations) and ends with recycling. In addition, innovative production methods illustrate the packaging industry's efforts towards greater environmental awareness [12].

Workflow innovation is at the basis of technology enabling people become more efficient and boost productivity of many companies. In several webinars, were presented latest workflow innovations and showed reveal how they can support business to transform and grow.

Among all global trends one can be noted, the replacement of plastic in packaging materials with circular materials like nanocellulose films and coatings.

Using a new sustainable material like nanocellulose for being used as a coating on paper to provide barrier function and to cast the nanocellulose onto a release liner to produce a transparent film of nanocellulose to replace PET. The processes have been developed in the European Horizon 2020 project and include coating technologies and drying technologies, which had been modified to reach the requested results [13].

Companies targets three pillars of sustainable flexible packaging:

1. Compostable, biodegradable and bio-based;

2. Mono material (PP/PE);

3. Paper or fiber-based (challenging barrier and flexibility targets and compatible with paper recycling stream).

Compostable, biodegradable and bio-based can be made from natural and renewable resources: PLA, PHA, PHB and PHV, cellophane and have the ability for industrial and home composting [14].

For more than 40 years the innovative equipment manufacturer from Germany Coatema provides flexible and efficient lab2fab solutions for coating, printing and laminating. Their business strategy and value proposition has been focused on innovations for growing markets with new coating technologies requirements, such as printed electronics, sustainable packaging, membranes, renewables and medicine.

An important issue has been and remains is food safe provided by paper packaging in procurement and printing.

Good health is on everyone's mind, now more than ever. Many areas of the printing and packaging industries are heavily regulated to protect the consumer. The requirements around food packaging are some of the strictest around and aim to avoid chemical, biological, physical and allergy risks.

Company Mondi contribute to a better world by making innovative, sustainable packaging and paper solutions. Consumers and brands are looking for products that minimize impact on the environment and maximize functionality.

Mondi's Food Safety Laboratory is accredited to the highest international standard according to ISO/IEC 17025 as a testing and analytical laboratory for packaging that is in contact with food and other sensitive substances, such as medicines [15].

This industry-recognized laboratory, supports the development of safe and sustainable custom packaging solutions that are engineered for food contact, enabling customers to meet the most stringent regulatory requirements for consumer safety.

In flexible packaging and engineered materials, experienced experts develop innovative flexible film and laminate solutions for packaging, personal care components and extrusion applications with state-of-the-art equipment in analytics and pilot plant, taking into the latest developments in raw materials as well as in processing and conversion technologies [16].

We live in a fast-changing world, driven by megatrends, such as population dynamics, digitalization, shifting production patterns, resource scarcity, and climate change. What will the world look like in 2050, and how can the global printing and packing industry engage in, and help shape development, which is truly sustainable and meets economic, social and environmental needs?

In a landmark development in 2015, the United Nations General Assembly adopted the 2030 Agenda for Sustainable Development. The 2030 Agenda provides a global blue print for action, based on sustainability considerations. It has been widely endorsed by Governments

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and stakeholder groups, including industry. The leaders in the printing and packaging industry will be encouraged to embrace sustainable development solution through visionary leadership and bold transformative action [17].

Conclusions

As a result, new materials, technologies and equipment were presented at Virtual Drupa.

The circular economy has emerged as an overarching policy theme, which is likely to guide sustainability policies and practices in the year to come. Concepts such as sutainable supply chain management, extended producer responsibility and life cycle management will become imperatives, rather than option.

A lot of measures to decrease waste across the whole production cycle to reduce the destructive environmental influence of printing and packaging industry have been conducted. The leading companies offer a lot of innovative solutions. All of them can make a huge helpful effect on sustainability. The need for biodegradable and recyclable packaging is quite large today. In the developed countries, most disposable packaging is made from such materials. Market leaders predict that 100 % reusable, recyclable or compostable packaging is a new reality by 2025 or earlier.

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Основним завданням цієї статті є оцінка сучасного стану пакувальної галузі за результатами міжнародної конференції Drupa 2021. В ній описані результати виставки Drupa 2021 як основної події поліграфічної галузі, яка проходила в Дюссельдорфі (Німеччина) з 20 по 23 квітня 2021 року.

Ключові слова: Друпа 2021; біорозкладане паковання; технології виготовлення паковань; флексографічний друк; екологія; переробка паковання.

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