South-East European INDUSTRIAL market

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Metal cutting machine tools manufacturers and suppliers in SEE

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euroLighting presents: Flicker-compliant AC COB modules according to the new EU regulation 2019/2020 DCMF series from RFsemi

Nagold, 17 May 2021 - euroLighting introduces the new DCMF series of AC COB modules from RFsemi. They emit a pleasant, low flicker light without the need for an external power supply and thus comply with the new EU regulation 2019/2020.

Starting from 1 September 2021, with the entry into force of EU Regulation 2019/2020, newly introduced light sources must comply with the limits of the new flicker and stroboscopic effect parameters PstLM of 1.0 and SVM of 0.4.

The flicker parameters of the new DCMF COB modules correspond to a PstLM value of less than 0.08 and an SVM value of 0.08 to 0.2, which is up to 92% below the required limit of the EU regulation and produces a pleasant, low flicker LED light for the user. The manufacturer was able to solve the problem of the typically strong flicker with AC modules by integrating two high-quality electrolytic capacitors, while retaining the advantages of AC technology such as a long service life of more than 50,000 hours, an excellent power factor of 0.95 and significant space savings.

The new COB modules of the DCMF series are available from euroLighting in 5, 10, 15, 20 and 30W and optionally in correlated colour temperatures of 2700, 3000, 4000 and 5000K. They have a high CRI of >90 and are equipped with two miniature plugs for direct connection to 230VAC. The scope of delivery includes a cover to which a reflector can be easily attached with the help of a bayonet catch. Suitable reflectors are available in beam angles of 15, 24 and 38°.

Fig. 2

With their low flicker parameter, the AC COB modules of the DCMF series are up to 92% below the required limit value of the new EU regulation (Fig. 1).

The COB modules are supplied with a high-quality cover to which a suitable reflector can be attached without any further aids (Fig. 2).

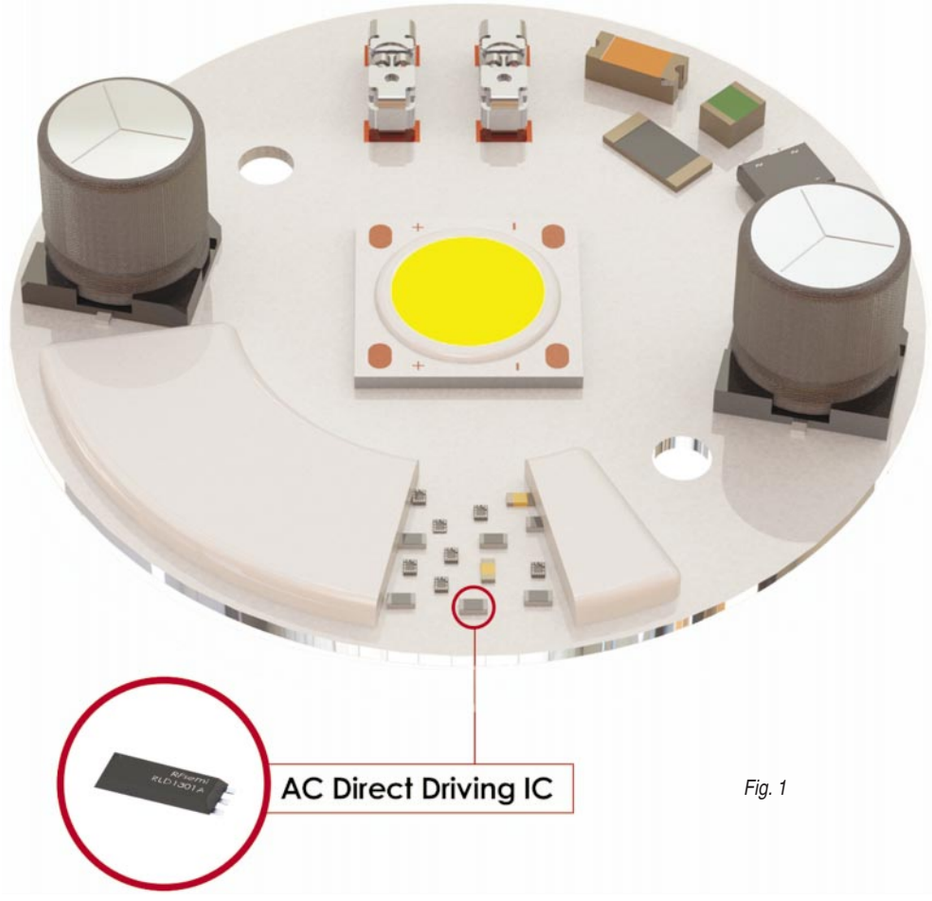

Fig. 1

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About euroLighting (www.eurolighting.de):

The euroLighting GmbH from Nagold concentrates on the distribution and development of modern LED technology. The LED modules in driverless AC technology are suitable for installation in all types of lamps and no longer require a conventional power supply. A novelty are the LED products with sunlight-like spectrum, which have a positive effect on the health of humans and animals. Here euroLighting offers both light-emitting diodes and various types of ready-to-use LED light sources.

The product portfolio of modern LED light sources also includes street LED lamps up to 150W (≤ HQL 400W) including night setback as well as complete Smart City systems for building an intelligent city. Screw-in modules to replace HQL and NAV lamps in luminaire heads, cylindrical designs, T8 LED tubes and LED area lights complete the range.

Pictures (Source: euroLighting/RFsemi)

endrich
components of life

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Chemicals and materials for electronics production

According to a recently published report by ResearchAndMarkets.com the electronic chemicals and materials market size is projected to grow from USD 58,8 billion in 2020 to USD 81,7 billion by 2025, at a compound annual growth rate (CAGR) of 6,8% during the forecast period. The major factor that is driving the market is the growth of the microelectronics industry, characterized by the emergence of new technologies. The silicon wafers segment is projected to register the highest CAGR during the forecast period. During the forecast period the semiconductor application segment is expected to hold a larger market share.

The fastest-growing electronic chemicals and materials market during the forecast period is estimated to be APAC due to the rapid growth of the global electronics industry, which has driven the demand for printed circuit boards in the region, ResearchAndMarkets.com's report states. The printed circuit board industry's growth is directly associated with the development in telecommunications and IT, smart cards, electronic gaming, and consumer goods applications.

Solder paste

The external interconnection features (such as leads, bumps, or balls) of surface mount devices (SMDs) are usually soldered onto a printed circuit board (PCB) through a board mounting process that consists of three basic steps – application of solder paste on specific locations on the PCB, or solder paste printing; positioning of the components on the board; and solder reflow.

Solder paste, which is used primarily as the attachment medium between the device interconnection features and the PCB itself, is a specially blended paste that consists of a flux medium containing highly-graded solder alloy powder particles. The components of a solder paste are designed to give it excellent printing and reflow characteristics. Reflow refers to the process of exposing the solder paste to elevated temperatures to melt the solder particles and allow the liquid solder to form a good and reliable connection with the board-mounted devices.

In addition to serving as the source of solder material that forms the mechanical and electrical connection between the SMDs and the board, the solder paste also keeps the components in place on the board prior to the reflow process, cleans the solder landing sites on the PCB as well as the external interconnections of the components and prevents these PCB solder lands and device interconnections from oxidizing until the soldering process is finished.

Experts believe that there are several factors to consider when choosing the right solder paste – the size of the solder alloy particles in the solder paste, the properties of the flux medium, the design of the stencil to be used, the paste printing parameters to be used, the tendency to form voids and other defects and, in sensitive devices, alpha particle emission rate.

The minimum size of the aperture openings of the stencil to be used in printing the solder paste over the board or substrate limit the particle size of the suitable solder paste. Large particles can easily clog the stencil apertures, resulting in poor printing quality and requiring frequent cleaning that slows down production. Particle size becomes more critical as the amount of solder to be deposited becomes smaller. According to specialists, the particle size of the solder paste should be no more than 12% the size of the smallest aperture opening of the stencil, i.e., at least 8 particles should be able to pass through the narrowest aperture gap at the same time.

The flux of the solder paste must have rheological properties that allow high-yield printing at very fine pitches. Naturally, the flux must also exhibit excellent chemical activity for removing the thin oxide films and other contaminants from the surfaces of the metals being soldered. The flux must be easy to activate thermally, but should not decompose easily. It must also form benign residues that are quickly removed by washing.

The stencil's aperture size-to-spacing ratio affects the printability of the solder paste. The shape of the aperture can also affect the size of the deposited solder for the same pitch. The stencil must be thin but rigid enough to resist deformation.

With respect to the solder paste, the printing parameters must also be optimized. For instance, paste viscosity affects the speed at which printing can be done. Adequate fluidity is required to allow a good roll that fills up apertures properly. At the same time however, the paste also needs to exhibit enough stiffness to form a well-defined deposit when the stencil is separated from the board or substrate.

Pastes with the tendency to form excessive voids must be avoided. Voids must not be more than 5% of the solder in case total elimination is impossible. Lastly, experts warn about the possibility of the solder paste emitting alpha particles that can cause soft errors in memory devices, so this must be looked into if the process involves high-density memory devices.

Several types of evaluation tests are performed for solder pastes selection – solder balling test; wetting test; solder void potential test; shelf-life test; tack life test; stencil life and abandon time tests; slump tests. In-process evaluations must also look at the printability of the paste (relax/recovery properties, print speed, print durability), its component placement characteristics, and the quality of its solder joint/fillet formation. Solder joint reliability tests used for qualifying solder pastes include the temperature cycle test, the thermal shock test, the impact resistance test, the pressure cooker test, and the temperature-humidity-bias test.

Fluxes

Fluxes can be classified on the basis of three key characteristics. These attributes also govern whether boards need to be cleaned after soldering. However, the level of acceptability is not necessarily universal and depends on the requirements of the product. These three attributes are activity, solids content and material type.

Low-solids/no-clean fluxes typically have 2% to 8% solids content and can either be solvent based (with or without rosin/resin), or water based (VOC-free) containing no rosin or resin apart from rare exceptions. They exhibit low to medium activity, a short life (in-process), and may or may not require cleaning.

Rosin fluxes are full/high-solids rosins with 15% to 45% solids content, and are solvent based. Their activity may be low but is normally medium to high, they have a long in-process life, and they are typically always cleaned.

Water soluble fluxes generally have high solids content in the range of 11% to 35%, are usually solvent based, have a very long in-process life, are always highly active and always cleaned.

Cleaning agents

Within electronics production cleaning is meant to remove harmful contaminants such as flux, solder and adhesive residues, and other more general contaminants such as dust and debris present from other manufacturing processes and handling. It also impacts positively product lifetime by ensuring good surface resistance and by preventing current leakage leading to PCB failure.

Cleaning is required prior to stencilling and soldering in order to remove contaminants from the many previous production stages, after stencilling to remove excess adhesive, and after soldering to remove corrosive flux residues and any excess solder paste. Today, many manufacturers are applying „no-clean“ processes, where the solids content of the flux is lower than traditional types, however they still contain rosin and activator which are not removed prior to the next process, such as coating or encapsulating of the PCB. Such residues, along with any other unwanted elements collected due to the missing cleaning stage, could cause issues with adhesion and possibly affect the performance of the protecting media applied.

There are two main categories of cleaner currently available, solvent based and water based. Traditionally, solvent based cleaners such as 1,1,1-trichloroethane and 1,1,3-trichlorotrifluoroethane dominated the market; however, due to their ozone depleting potential, they have been replaced by a more diverse range of solvent cleaners. This category is now typically divided into three sub-sections; flammable solvent cleaners, non-flammable solvent cleaners and non-flammable halogenated solvent cleaners such as HFCs and HFEs. All three types have their advantages and disadvantages but overall solvent cleaners can be described as fast evaporating, single stage cleaners. However, they require specialist equipment and extraction to protect against toxicity and other possible hazards.

Water-based cleaners were also developed to replace ozone depleting chemicals as well as offering a solution to reduce solvent emissions. Water-based cleaning has several advantages over solvent based cleaners including non-flammable properties, low odour, low/non-VOC and very low toxicity. There are many applications for cleaning, all of which depend on the type of equipment available. Whether it be ultrasonic, spray under immersion or dishwasher type application, identifying the correct water-based cleaner for the specific job is essential. Water-based cleaners tend to be much more complex than their solvent based counterparts. They utilise surfactant technology to assist the removal of contaminants from a PCB by reducing the interfacial tensions and suspending or emulsifying them in solution. Alternatively, water-based flux removers work by saponification, neutralising the flux acids. The only major disadvantage of water-based cleaners is that they require multiple stages to complete the cleaning process, including a two-stage rinse process and a final drying stage. There are also surfactant-free water based cleaners based on glycols. These cleaners combine the advantages of water based and solvent based cleaners with only minimal rinsing required.

Hybrid Power Controllers – Bridging the Analog and Digital Domain

Arild Rodland
Microchip Technology

You may have noticed how more and more electronic devices continue to fill up your life. Devices that used to be quite simple and mundane seem to evolve into smarter and more complex technologies. Even your simple tooth brush is getting an electronic cousin that is motorized and internet connected - with pressure detection and guided brush time - for that perfect smile.

Some devices use batteries while some are connected directly to the mains, but common for all is that they need a power supply. If we expand our view to look at the world, the number of powered devices is in the billions. It stands to reason that there is a huge benefit if every device tries to use and waste as little power as possible.

The demand put on power supplies with smart devices is higher than it used to be as modern applications tend to switch from spending milliwatts in stand-by mode to spending hundreds of watts when on.

To support this wide mode of operation, traditional switch mode supplies are not good enough. You need a power supply that can switch modes on the fly.

Traditionally, power supplies were implemented as an analog solution, either using discrete components or analog power devices with supporting components. This way the complete control system was implemented as an analog feedback loop. The advantage is that these systems are quite cheap and easy to design. There is a large portfolio of ASIC switch mode solutions out there, tailored for most common use cases, but many of these are not able to adapt to the changing needs of modern smart devices.

Digital power supplies on the other hand are very powerful. Fully digital power supplies digitize all input signals and subsequently all signal processing is done in the digital domain. This requires massive computing power to control, so this has traditionally been in the domain of dedicated DSPs and microcontrollers with high computational performance. Digital power supplies have many advantages over analog solutions. They can easily adapt to different topologies and easily be tweaked and tuned for maximum efficiency. The main disadvantage of a fully digital solution is cost and development complexity.

So, on one side we have analog power supplies that are cheap and fast, but not very flexible, while on the other side we have digital power that is very flexible and powerful, but also more complex and quite expensive.

Wouldn't it be great if a third option existed, one that combined the benefits of both the analog and digital power solutions?

This is where hybrid power systems come into play. In a hybrid power solution, the feedback loop is analog, but digitally enhanced. This way hybrid power systems combine digital logic with analog circuits to leverage advantages of both worlds in a single device. Having a digitally enhanced analog loop, allows us to easily change topology or control mode run time to tune the application for best possible performance.

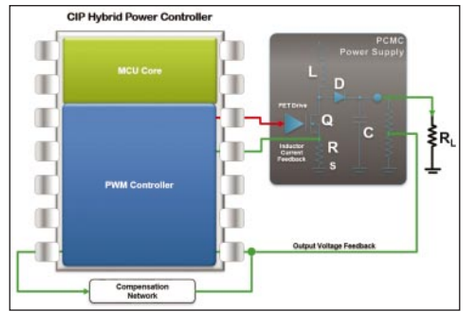


Figure 1

Let's look at a quick example to illustrate its advantages.

In battery charger applications, you need to follow strict charging characteristics for a given battery cell. Some will require charging at a fixed and regulated current in the early phase of charging, and when the battery is getting close to fully charged, it switches from current control to voltage control - where voltage is regulated, and current is reduced.

For a hybrid power solution, this is a very simple task. Just start in current mode control, and when it is time, switch over to voltage mode control. Hardware and topology remain the same, but sensing is switched.

As mentioned, the hybrid power solution is based on a digitally enhanced analog loop system. This whole hybrid power system is set up to run in Core Independent Peripherals (CIPs). Microcontrollers with CIP hybrid power capabilities have an advanced autonomous PWM controller which is highly configurable to support a wide range of topologies and control modes.

Figure 1 shows a very simplified illustration of a CIP hybrid power controller. It consists of a general-purpose microcontroller and a PWM controller capable of running fully independent from the rest of the microcontroller. This PWM controller is divided into three main functions, as shown in Figure 2. The modulator block is responsible for generating the switching signal to the external power transistors. Depending on control mode, it will use a current or voltage feedback signal to regulate the duty cycle. It also includes slope compensation for stability. The fault module is responsible for shutting down the power in case of short circuit or overcurrent.

Configuring the whole system into a single independent module is a huge advantage from a system point of view as the power supply can run independent, and the MCU can freely be used for higher level functions like communicating with a main controller, doing board control functions or providing high end control of the PWM controller.

In the case of LED lighting, getting the right color or temperature requires very precise control of the current. Ambient temperature may affect this, but in a microcontroller with a hybrid power solution, the microcontroller can easily monitor ambient temperature and compensate accordingly.

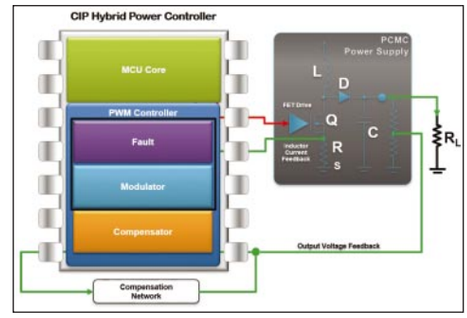


Figure 2

You may say that controlling a RGBW LED strip requires four independent channels, in which case you will then be pleased to know that some of these CIP hybrid power controllers contain four fully independent PWM controllers that can all be controlled individually. They do not need to output the same voltage either. You can use one of these devices for providing 1.8 V, 3.3 V and 5 V to your system.

Design Challenge - Keeping It Simple

Microcontrollers are generally programmed using high level programming languages like C, while power supply designers generally use analog simulation tools to design and debug their designs. Traditionally microcontroller software developers have little or no experience when it comes to designing power supplies, and likewise, power system designers often have little experience writing code for microcontrollers. This provides a challenge. How do you enable an experienced power designer to program and configure a hybrid power controller?

The answer is to provide graphical development tools that simplify the whole configuration of the PWM controller into a few simple steps. Behind the scenes, the development tool generates all necessary initialization code needed to set up the PWM controller e.g. a sync buck topology with peak current mode control with all the correct modulation, compensation and fault detect.

Microchip has released such a line of microcontrollers called the PIC16F176x and PIC16F177x. These provide up to four independent PWM controllers and are fully supported in MPLAB® X in the graphical code configurator. This tool has been designed with analog power designers in mind and is laid out the way designers would usually go about designing an analog power supply. Instead of writing C code and configuring registers, you just select power supply topology, control mode and fill out proper values like switching frequency and max PWM duty cycle. Then the configurator takes care of the rest and generates the initialization code.

The strength here is that during normal operation, no code is running.The code is just for setting up all the interconnects in the PWM controller. Once running, the PWM controller can operate completely without MCU interaction.

More information on CIP hybrid power controllers can be found at www.Microchip.com.

Touch Solutions for Hazard Prevention

World's First Safety Certified Capacitive Touchscreen Controllers for Home Appliances

Put safety first, while reducing cost and enabling modern user interface solutions in home appliances.

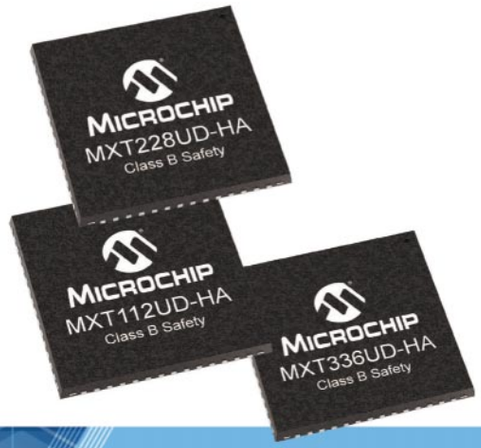
Microchip's latest family of maXTouch® capacitive touchscreen controllers offers system-wide, pre-approved IEC 60730 and UL 60730 Class B-certified firmware—a market first. These pre-certified touchscreen controllers help you achieve your required system certification in a single chip, while also eliminating the need for an additional microcontroller, reducing design time, cost and overall design risk.

Specifically designed for the home appliance segment, the mXT336UD-HA family features both power-on self-test and periodic built-in self-test diagnostic capabilities that ensure the intended operation and functionality of the CPU, timers, communication buses, memory and touch analog front end.

The embedded diagnostic features of this family of touch controllers ensure correct operation of the touch controller itself, as well as the connected touch sensor. When a failure condition is detected, the mXT336UD-HA family immediately notifies the host system, enabling the appliance to fail-safe and reduce hazardous threats.

Key Features

- Allows reliable detection and tracking of multiple fingers on surfaces exposed to moisture, water, grease and more—even if the user is wearing gloves
- Software and hardware tools available including maXTouch Studio, maXTouch Analyzer and evaluation kit



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Metal cutting machine tools manufacturers and suppliers in SEE

According to a report by Fortune Business Insights, published in 2020, the global metal cutting tools market size amounted to USD 77,24 billion in 2019 and is projected to reach USD 101,48 billion by 2027, exhibiting a CAGR of 4,2% during the forecast period. The increasing demand for metal cutting equipment from various industries, including aerospace, defense, automotive, and industrial machinery results in the growth of the market. The surging demand for efficient equipment in critical and complex machine component requirements is expected to drive the industry in the near future. Furthermore, the increasing popularity of CNC machines is also a factor for market growth. This is attributed to the advantages offered by CNC metal cutting tools including high efficiency, transparency, cost saving, and time efficiency.

The impact of the coronavirus outbreak on the market has been relatively less significant in the eastern countries such as China, South Korea and Japan, whereas the western part of the world has suffered drastically. In the short term, the major impact primarily lies due to the disruption of manufacturing activities globally. The enormity of these disruptions increases as the number of cases surge at a global level. Moreover, the impact on the manufacturing industry of the metal cutting tools will be far more extensive if the virus impacts other main industrial countries beyond India, China, and Germany. In the long term, the industries, related to the application of metal cutting tools are likely to be back on track, thus, resulting in considerable demand for machines in the coming years.

Global market trends

The increasing popularity and technological advances in additive manufacturing have increased the demand for metal cutting tools. For instance, the 3D printing technology is gaining the interest of key players in the industry. The technology's benefits such as optimal use of raw materials, waste reduction, and ease of production of various complex geometries are expected to drive the market. The widespread applications of 3D printing in automotive, construction, medical devices, and robots are further expected to result in the growth of the additive manufacturing industry in the future.

The demand for automation in factories is increasing the utilization of smart manufacturing technologies for production processes and product development. This is attributed to the benefits such as improved productivity, product quality, and ease of coping with labour shortages. The manufacturing and machinery operations will witness a paradigm shift from conventional methods towards intelligent, connected, and streamlined machine systems. Through Industry 4.0 solutions, manufacturers are able to benefit in operational savings, efficient energy usage, enhanced and automatic virtual metrology, and enhanced human-machine interfaces.

Several companies are concentrated on automating their manufacturing processes; however this involves high purchasing, training, and maintenance cost of machines. Also, one of the major factors affecting the growth of the market is fluctuating raw material prices. Furthermore, amid the ongoing pandemic, companies face trouble adjusting to the changing needs of the hour. The companies are currently going through a severe cash crunch, as a result of which they are required to downsize and reduce work force. This is expected to affect companies' revenue in the coming years based on the severity of the current economic situation because of the pandemic.

Based on the product, the global market is segmented into machining centers, lathe machines, boring machines, grinding machines, milling machines, etc. The lathe machine segment is expected to be the fastest growing type of metal cutting tools. This is attributed to the increasing demand from the automotive sector. Moreover, the high popularity of CNC lathe machines will drive the market. The benefits offered by CNC lathes, including high efficiency, production of complex details, efficient mass production, and low maintenance, are resulting in the growth of the metal cutting tools market.

Furthermore, machining centers hold the major market share and are expected to dominate during the forecast period. This is attributable to the increasing need for mass production from various industries including automotive. The advancements in precise cutting have resulted in increased demand for milling and boring machines. The grinding machines are gaining popularity in the machine tools industry owing to the increasing application of surface grinders, cylindrical machine grinders, tool and cutter grinders.

Asia Pacific holds the major market share and is expected to remain dominant during the forecast period. Europe and North America are expected to exhibit lucrative growth during the forecast period as a result of increasing demand for prefabricated metals.

Major players in SEE

Alfa Metal Machinery. Romania's Alfa Metal Machinery is among the biggest sales and service companies for high precision machine tools in Eastern Europe. Its main activity is sales and service works for all customers in the metal cutting industry and metal mass production business. The company's portfolio includes chamfering machines, CNC metal sheet laser cutting machines, CNC shears-guillotines,

thread cutting machines, horizontal and vertical machining centers, lathes, cylindrical grinding machines, etc.

Durma. Turkish company Durma is a global manufacturer operating in the field of metal sheet processing machinery with an expert staff team of 1500 people, a wide production line equipped with the latest technology and facilities with the closed space of 150 thousand square meters. Today, Durma exports to 120 countries together with 80 distributors as business partners, and approximately 80% of the machinery manufactured arrive to the buyers in developed industrial countries like the USA, EU members, and Australia. The remaining 20% consists of companies in developing countries or companies thereof that establish partnerships with foreign investors.

Ermaksan. Turkish company Ermaksan is a leading industrial organization that shapes the sheet metal processing machines sector with its strong R&D, that produces high-quality machines with high technology with more than its 800 qualified staff in its modern production facilities. It continues to carry out future oriented R&D works such as fiber laser technologies, new machine models; Industry 4.0 applications and 3D printer (additive manufacturing) machines. The machines produced by Ermaksan now operate in 110 countries.

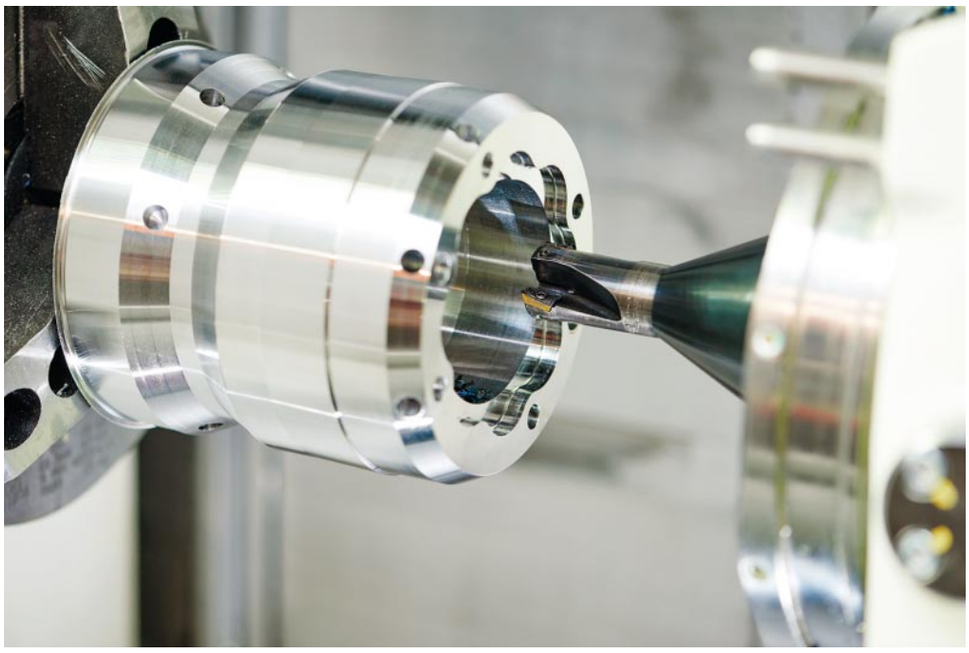
Continuously following the new trends and customer expectations, and designing and producing machines with advanced technology, high added value, that are environment friendly and energy saving, Ermaksan takes firm steps forward on the way of sustainable growth by using resources efficiently.

Ileri Teknik. Turkey's Ileri Teknik is a manufacturer of heavy duty manual and semi-automatic cut off machines. After 10 years of supplying services to the metal and automotive industry, Ileri Teknik joined the designing and manufacturing side of the industry and for the last 20 years it has been building up to be one of the major manufacturers of circular sawing machinery.

In 1995 Ileri Teknik began its expansion into the development of circular saws and has ever since been at the forefront of the industry. Starting with the production of manual machines they have worked their way through to semi and fully automatic models. Ileri Teknik's machines are now largely exported to many of the major exports markets.

Nukon. Nukon Bulgaria offers a chance to every manufacturer to add to his production base a boutique designed machine. The company provides a 24-month warranty for its machines and fast technical service. Nukon's main production is fiber laser cutting machines, also plasma cutting machines, oxy-flame cutting and water jet machine tools.

Polymeta C. Bulgarian company Polymeta C is one of the leading suppliers of metal processing machines, tools and equipment. It offers a large range of products designed for optimal metal processing, cutting, bending, etc. The company has established itself on the Bulgarian and Balkan machine market as trustworthy, accurate and precise. Polymeta C is an official dealer for Bulgaria of DMG MORI, Durmazlar Makina, Karmetal, Matrix, CBC, FIAC Compressors and more. The company's team consists of highly qualified engineers and experts. Its head office is based in Sofia, with showrooms located in Sofia, Veliko Tarnovo and in Stara Zagora.



RAIS. For more than 25 years, Bulgaria's RAIS has been the leading company in the Balkans and Europe for the production of CNC machines, tools and equipment for various sectors of the industry. The company's portfolio includes different types of CNC milling and turning machines, 3-axis centers, 5-axis centers, horizontal machining centers, single-spindle and twin-spindle lathes.

RAIS offers not just machines and equipment, but complete solutions to its customers. They get a fully customized machine based on their needs and their job. RAIS provides complex solutions through estimates of production time, tooling, commissioning, training and after-sales service of all types of CNC metal cutting machines.

Manufacturers from various industrial sectors from more than 20 countries in Europe, the Middle East, Asia and Africa have trusted RAIS. RAIS has offices and dealers in Germany, Austria, Switzerland, Russia, North Macedonia, Greece, Spain, Italy, Romania, the Middle East and others.

REM Machine Tools. Romania's REM Machine Tools is specialized in vertical turning lathes. The REM vertical lathes are designed for high machining accuracy, very good rigidity and stability, in conditions of heavy machining of metal, including asymmetrical pieces. The company uses a personalized ERP software solution and design specialists work with tools such as Solidworks, Eplan and Visio. The Machine Tools Division of REM has a key role in the company and is considered one of the most important. The extended knowledge of the company's specialists and the continuous acquiring of new technology helps REM build reliable and high quality products. Its heavy machine tools, including the vertical turning lathes, execute specific operations like turning and milling.

Stournaras Machine Tools. Greece's Stournaras Machine Tools was founded in 1983, with main interest in import and selling of metal cutting and forming machinery. The company claims that the long experience of its personnel in the field of selling and support of the machine tools, can be confirmed by the quality of the provided machinery. Stournaras Machine Tools's partners include Ermaksan, Karmetal, Akyapak, Bendmak, Arsenal, Gecam, Rolleri, etc. It is able to supply a wide variety of advanced technology machine tools, like sheet metal forming machines both conventional and CNC, as well as metal cutting machines. They can either be on stock or specially ordered.

Automation is the only way to success in agriculture

Ilia Iordanov, Co-Founder and CEO of ONDO Smart Farming Solutions, for South-East European Industrial Market Magazine

ONDO Smart Farming Solutions won the „Innovative Start-Up" award in The Innovative Enterprise of the Year 2020 national contest for its intelligent solution for automated management of agricultural processes, developed by a team of agricultural, software and hardware specialists. What is the right approach to professionals in such different fields collaborating successfully?

Consolidating expertise in the fields of agriculture and digital technologies is a key factor in the successful development of any state-of-the-art farming automation solution. Our ONDO system represents a symbiosis between hardware and a software application, offering digital automation of all important agricultural processes such as irrigation, fertigation, climate control, monitoring, etc. ONDO is suitable for implementation in greenhouses, vineyards, orchards, maize and vegetable fields. Thanks to feedback from our customers, we have a clear idea of the specific benefits regarding the implementation of ONDO in agricultural units. Customers have shared results of achieving up to 85% lower irrigation water costs due to precise management and control of water resources, up to 50% lower energy costs due to optimized consumption of power, diesel, gas, etc., up to 40% higher crop yields, a significant reduction in the costs for fertilizers and agricultural chemicals, and up to 60% less losses, caused by different types of human error.

Tell our readers more about the technology and the automation tools the solution is based on. What are the challenges in integrating the software and hardware components and the agricultural equipment itself?

ONDO is an IoT-based technological solution – using sensor data and preset programs we remotely control (by wire or wireless means) drip irrigation, ventilation, fertigation and all other processes in a greenhouse or an agricultural field, making them more efficient and more profitable, while saving farmers time and effort to invest in developing their business.

What is unique about us is the business model, which provides our customers with the basic equipment at an affordable price and an annual subscription plan, based on the chosen level of automation. This significantly reduces the initial investment for installation and allows farmers to rapidly implement the ONDO system with the option to upgrade it later if necessary. Furthermore, thanks to the easy way of controlling the system through a smartphone or a computer, it becomes an invaluable high-tech assistant in the everyday life of farmers.

How do you rate the current role of farming automation for Bulgaria's agriculture sector and what direction do you think it will take in the future?

Automation is the only way for farmers to be successful. One of the most significant problems in Bulgaria, however, is the lack of reliable publicly available national data on the number and types of agricultural holdings and the degree of their digitalization. This complicates reaching all farmers for us and makes marketing research and professional planning a very challenging process. It has been established that Bulgaria takes up one of the last positions in the EU in terms of digitalization of the economy and this, unfortunately, is largely true for agriculture. Therefore, it is crucial to enforce as soon as possible Submeasures 4.1 – „Investments in agricultural holdings" and 4.2 – „Investments in processing/marketing of agricultural products" of the Rural Development Programme. Most of the funding comes from the NextGenerationEU instrument, which is aimed at the digital economic recovery of the sector as a result of the COVID-19 crisis. It will enable farmers to finance automation of irrigation, fertigation and climate control in their agricultural units. In this sense, these measures are a huge step towards overcoming the deficit of digital technologies in Bulgarian agricultural production.

Otherwise, what we can conclude from our constant communication with farmers in the country is that there is a changeover of generations in the sector, which has a strong beneficial effect on its development – the children of experienced farmers take over the business from their parents with new modern vision and an open mind to automation and digital technologies.

In the long term, what is your vision for the development of smart agricultural solutions with a view to automation in your upcoming projects?

We are constantly working on improving the system and all our customers regularly receive its latest versions, as well as detailed information about the implemented updates. Our goal is for the system to become increasingly autonomous, to cover more and more agricultural processes and to require less commitment from the farmers towards the managed unit. For example, we are currently working on the capability of creating and applying ready-made recipes for growing specific plants at each stage of their development, based on the data collected in the specific agricultural unit, while adapting these recipes through continuous monitoring and real-time video surveillance.

We have also made significant progress in creating the ONDO Educational Hub, which will offer the comprehensive know-how of our team in the field of agronomy, automation and digital cultivation of crops, as this is a dynamic field and farmers constantly need guidance and advice about the various options that are available to them.

Movement is our passion.

Our strain wave gear - We think ahead.


HIWIN

Increasing demand is a favourable opportunity for Bulgarian electronic production

Igor Levin, CEO and founder of Antelope Audio, for South-East European Industrial Market Magazine

Antelope Audio (Elektrosfera) won the „Innovation Management" within the Innovative Enterprise of the Year 2020 national contest. Tell our readers more about the company's converter for real-time processing and modelling of music effects.

In the field of recording, you will frequently come across the debate about the difference in quality between analogue and digital effects. Traditionalists often talk about the uniqueness of analogue sound and its warmth and colour, which lies in the physical components and their „imperfections". They argue that despite the potential of digital technology, analogue sound cannot be reproduced. On the other side, people who mainly use digital effects welcome their accessibility and the clarity with which they process the signal – you get exactly what you hear through the headphones.

One of the unwritten rules in Antelope Audio's working process is not to take sides in this debate. Inspired by analogue audio and the way music has been recorded in the past, we are not denying that some of the magic has been lost with the advent of digital technology. Still, we are aware of the fact that not everyone has access to the large recording studios of the last century. Furthermore, although they have analogue devices, the owners of these studios spend a lot of time and money on their maintenance.

As a technology company driven by technological innovation, we strive to create a product that brings back what has been lost in the analogue world without losing what has been achieved in digital audio. This aspiration led us to the so-called field-programmable gate arrays (FPGAs) and their application in audio effects. We are glad that we were the first to recognize their potential and we remain the only ones making effects in this way.

Could you share more about the technology you used to develop the product and what were the challenges you faced?

FPGAs are programmable, which makes them very suitable for modelling the components of analogue effects – transistors, resistors, transformers – and their unique behaviour when interacting with power. In the digital domain, FPGA-based effects provide users with real-time signal processing without overloading the computer, and of course the luxury of having an entire effects studio in a relatively compact form.

Despite the sound quality and the advantage that FPGAs offer in the process of creating music, their development cycle was much slower compared to digital signal processors (DSPs) used by our market competitors. This prevented us from building a more scalable model for software creation, which to some extent limited the availability of our product.

That is why in 2019 we created the audio effects processing technology Synergy Core. It is a conceptual fusion of FPGAs and DSPs into one single „core", preserving the strengths of both and achieving a „synergistic" effect. FPGAs remain in the heart of the platform, but the addition of ARM technology-based DSPs gave us the opportunity to develop new effects much faster, making us more competitive in the market.

Nowadays, everyone wants to test out a variety of effects in the process of music making and Synergy Core has allowed us to satisfy this demand. Another difficulty that we have overcome with Synergy Core is offering different types of effects. Modulating the most used categories of effects such as equalizers, microphone preamps and compressors is suitable for FPGAs, but modulating effects such as guitar pedals is strictly DSP territory. Currently, Synergy Core offers a wide variety of effects, providing our customers with higher levels of flexibility.

What engineering approach did you chose and what electronic components did you use for the converter?

A large part of the working process in Antelope Audio is simplifying the complex. We strive for clean hardware design and maximum component optimization. The design of the devices has the ability to adapt to scale – the production of the simplest and most affordable device we have on the market follows the principle of the most complex device in terms of architecture and design. This is a major factor in the success of our latest products, which are aimed at novice artists and producers who make music at home. These products partially use the technology that drives some of our most expensive devices, which in turn brings the difference in sound.

Of course, the quality of our products goes as far as the quality of their components. We are glad that we have built reliable partnerships in the global supply chain, and despite the difficulties of the past year, we have been able to adapt successfully.

What is your long-term view on the technological trends in electronic production in Bulgaria?

In my opinion, the technological wave affects many sectors of the Bulgarian economy, including the electronic industry. The growing demand for various technological products worldwide is a favourable opportunity for Bulgarian business to increase its production, which in turn will attract additional investment. Due to the difficulties in the global supply chain, local production is becoming more attractive as it allows for more flexibility and control over processes and costs.

Technology and innovation in science are the tools of progress. Investing in education and R&D, promoting networks of scientific and business partnerships and sharing good practices - these are the trends I would like to see. Effort is required on all sides, but the process has begun and I believe it will go a long way.

Digital transformation and Industry 4.0 in SEE

According to the European Commission's estimates, in 2021 almost 1 million information and communication technology (ICT) specialists will be in demand in the labor market with the overall value of digital economy amounting to almost EUR 500 billion at the same time.

The European Union recognizes the need to develop, regulate and stimulate a framework for the digital economy in its member states because the digital economy, despite the fact that it is predominantly based on the virtual bits and bytes in cyberspace, is still limited by national legislative barriers, the technological (infrastructure) development of member states, the differences in standards and strategies, digital literacy and low levels of cross-border e-commerce. In response to all these challenges, the European Union has developed a range of strategies, legal proposals and financial instruments in the field of digital competitiveness and digital economy to ensure that the European Union remains at the top of global competitiveness, while at the same time its citizens and businesses can reap the benefits of the Digital Single Market and Industry 4.0.

Creating a framework for the functional Digital Single Market is especially important for the countries of Southeast Europe which, despite their leading positions in some segments such as cross-border e-commerce, are still far behind other member states in terms of creating a digital society and economy.

SEE region's struggle to reach the EU average in the digitalization of the economy and society is partly caused by their exhaustive transition process and political turmoil, but catching up with the rest of the EU in supporting digitalization and innovation can push the region into a new era of economic development and growth.

Croatia

Croatia has retained its status as one of the leading member states in SMEs selling online and cross-border trade. Almost 20% of SMEs are in the online sales with almost 9% of them doing so cross-border. EU average in this indicator is 16% and 7,5% respectively. However, Croatia is still lagging behind when it comes to Internet use and fixed broadband. Around 66% of Croats use Internet regularly (compared to the EU average of 76%) and less than 3% have high-speed connections (30% in the EU). This very low number of connections can be attributed to the fact that high speed networks mostly cover urban areas in Croatia and are considered to be extremely expensive. In comparison Croats on average spend almost 2,5 – 3% of their monthly disposable income on high speed internet compared to the EU average of 1,3%.

In the category of human capital, Croatia's performance is still below average, but the country is making small progress. Digital skills and STEM18 education remain quite low. Half of the population has basic or above basic digital skills, but less than 2% of Croatian students are in the STEM fields. The problem becomes even more serious when we consider that Croatia is the only EU member state that does not have obligatory ICT education in early stages of elementary education and is lagging be-

SEE NEWS

TUSIAD recommends Turkey focuses on green, digital transformation

Turkey can take a much stronger place with the EU in the post-pandemic era, said the head of the Turkish Industry and Business Association (TUSIAD).

„While the pandemic disrupts the structure of supply chains, it also creates new opportunities in the context of EU-based supply chains, from which Turkey can benefit," Simone Kaslowski said in his speech at the opening of the 23rd Enterprise and Business Summit.

Kaslowski said companies should include more sustainable and climate-friendly production patterns in their processes to maximize resource and energy efficiency potential. „We need to work together to protect the competitiveness of the EU and Turkey, to strengthen integration and advancement towards full membership. The world is moving towards digital transformation, green industrial revolution," he said, and warned Turkey should not lag behind green transformation efforts taking place worldwide.

Huawei considers new regional logistics hub in Slovenia

Chinese company Huawei plans to set up a regional logistics hub in Slovenia for some 19 markets of central and south-eastern Europe. Thus, the flow of its goods through the port of Koper will increase and new storage facilities will need to be built near Ljubljana airport.

The company said this meant that the transport flows of its goods for 13 EU and six non-EU countries would be redirected to the port of Koper and the airport in Brnik near Ljubljana. The value of the investment decision is estimated at some EUR 9 million with potential for further growth.

According to Beata Bogadi, Huawei's customs compliance manager for Europe, Huawei recognises the strategic position of the Koper port, the qualified staff and services in Slovenia.

Huawei already transports about 185 000 cubic metres of cargo from China to Hungary and to other European markets through Luka Koper. The new logistics hub in Slovenia is to cut the delivery time of goods for customers in the EU.

hind in e-learning and the digitalization of schools.

On the other hand, the business sector in Croatia appears to be eager to take advantages of the possibilities offered by online commerce with almost every fifth company doing so. Other indicators like the usage of e-invoices and cloud services place Croatia within or higher than the EU average. In digital public services, Croatia's performance is improving. All indicators show growth – both in the number of users and services, and particularly in the open data benchmark where Croatia is well above the EU average due to the new approach of opening up datasets to the general public and private sector.

Slovenia

Slovenia remains a regional leader in Southeast Europe. Together with Croatia it is a part of the „catching-up" countries, but with a slower growth than its neighbor. Overall the Slovenian business sector is the best performing actor in the DESI index, reaching the EU average and above the average in the integration of digital technologies.

The country has almost the same indicators for basic digital skills (51%) and STEM graduates (2%) as Croatia, but with better numbers when it comes to ICT specialists (4,8% compared to 2,9%). It still has to catch up on the use of Internet benchmark, and its weakest ranking is in digital public services due to the fact that less and less citizens are e-government users and open data is not freely used by SMEs. In terms of connectivity Slovenia is below the EU average, but progress has been made. Slovenia has 84% coverage of rural areas and 95% of overall coverage with almost 21% of Slovenes having fast broadband, which is almost eight times better than in Croatia. Slovenia also has set in motion a new plan to cover 96% of the country with 100 Mbps broadband through a EUR 355 million public-private partnership.

Regarding human capital, Slovenia shares similarities with Croatia – 51% of the population has basic digital skills, around 2% of the graduates are in the STEM area but with slightly more Internet users (71% in Slovenia and 66% in Croatia), and a good position regarding the share of ICT specialists in the workforce that almost doubles the number in Croatia. But just like in Croatia, the specialized ICT labor is highly mobile and recruiting sufficient number of professionals can become a challenge in the near future. The development of digital skills and the importance of ICT education are well embedded in the whole educational system, from kindergarten to universities and through lifelong learning measures and complementary programs, to the formal educational cycle. The country also has a Digital Coalition that brings together stakeholders in the development of the digital economy and digital jobs. Recently, Slovenia announced measures to increase digital skills for the less educated and the less skilled segments of the labor force above 45 years of age.

In terms of the integration of digital technologies, Slovenia is performing better than in 2015 with considerable progress made in online and cross-border sales and e-Invoicing. With the new legislation in place that makes e-Invoicing obligatory when dealing with public administration it is expected that those numbers will rise even more. Also, almost 16% of SMEs are selling online, which is less than in Croatia, but with bigger turnover shares coming from that trade. In the area of digital public service, Slovenia has stagnated with almost no progress since last year. Even more oddly, the number of Slovenes using e-government has fallen by 5%. Therefore, the government has introduced a new portal with more than 30 services hoping that the citizens will pick up the pace. In contrast, e-health solutions like e-prescriptions are in full use in both countries covering almost 100% of the population.

Bulgaria and Romania

The research paper The Past and Future of Manufacturing in Central and Eastern Europe: Ready for Industry 4.0?, published by IZA – Insti-

tute of Labor Economics, Germany, in 2019, determines the industry 4.0 (I4.0) readiness of eight Central and Eastern European countries (CEECs): Bulgaria, the Czech Republic, Lithuania, Hungary, Poland, Romania, the Slovak Republic and Slovenia.

The findings laid out in the paper define Bulgaria and Romania as the least ready countries for the coming transformation. The research measures three key dimensions of I4.0 readiness, namely technological, entrepreneurial and governance competencies.

According to the paper all countries seem to be doing least well in terms of entrepreneurial competencies, especially Slovenia and Bulgaria. This indicates that there is no one recipe to improve I4.0 readiness: all will have to focus on the three dimensions of I4.0 readiness.

Furthermore, a concern for Bulgaria is that as the EU already noted, it is falling behind in terms of digitizing its economy (as measured by the EU's Digital Scoreboard 2016) and hence may find itself diverging from the Central and Eastern European countries in terms of industrialization.

Another factor that was taken into account was how government serves its customers (citizens) through digital services. Given the predominance of the digital economy in the I.40, it is also imperative that government be able to act and interact in the digital domain. In terms of this criterion Romania and Bulgaria are also lagging behind.

Furthermore, the research measures the extent, to which manufacturing is already seeing automation, and workers are getting used to working with robots. Density of industrial robots per 1000 of workers is based on data reported by the IFR. The country with the highest density of industrial robots in the CEECs is Slovenia, while Bulgaria ranks last.

Based on the technological competencies of workers Romania and Bulgaria are among the

least Industry 4.0 ready. However, tax rates on digital business in Romania, Slovenia and Bulgaria are lower than the average of 10,2% for the EU.

In terms of opportunity entrepreneurship, which is a measure of the share of early-stage entrepreneurship in countries actively pursuing an opportunity excluding necessity or forced entrepreneurship. Bulgaria and Romania have the smallest shares of opportunity entrepreneurs among the CEECs included in the research.

Industry 4.0 will have significant implications for the global distribution of manufacturing activities, the nature of manufacturing, and the contribution of manufacturing to employment and productivity growth. For instance, given the centrality of computers and data, locations with strong connectivity, ICT software and hardware, large availability of quality data and availability of highly skilled labour, with vibrant entrepreneurial ecosystems will become even more desirable for manufacturing. In the era of I4.0 it is not low labour costs that will primarily attract and sustain manufacturing: it will be how amenable a location is for hosting manufacturing that can be automated and digitized.

To promote the diversification of manufacturing exports towards non-traditional (and non-EU) markets and to keep manufacturing exports to EU markets more competitive, the countries form Southeast Europe need to consider exchange rate policy and focused export promotion (and trade facilitation) as tools to promote I4.0. It would seem that none of the current I4.0 strategies in the region explicitly considers these potential approaches.

The initiatives tend to neglect the entrepreneurial capacity dimension, in particular vital aspects for technology entrepreneurship, such as venture capital provision and the promotion of entrepreneurship to commercialize inventions and to find new opportunities both in the production of products for exporting and new export markets. In the past, it was FDI and trade that brought in technology but in future the local entrepreneurship and innovation systems, focused moreover on export diversification, will need to play a greater role.

Automotive components production in North Macedonia

With nearly 30 000 employees in numerous established companies contributing approximately 40% to annual exports, North Macedonia has become a key manufacturing location in Eastern Europe for first and second tier suppliers to the automotive components industry. North Macedonia's economic policies provide an attractive business environment in the region and the country displays high potential as a source of competitively priced components to the automotive industry.

Investors in North Macedonia's free zones enjoy 100% foreign ownership, 0% corporate and income tax, return of 10% of investment costs in construction, machines, and equipment, EUR 0,1 per m^2/year land lease rates, job creation grants, as well as fully developed and available infrastructure, which allows a quick start of operations. The existing engineering and manufacturing traditions in North Macedonia have enabled the automotive components industry to continually develop. The production of automotive components, dating back from the 1960s for the then Zastava car plant, licensed under Fiat, has reprofiled and modernized today with the entry of a number of multinational companies and tier 1 and tier 2 suppliers, in North Macedonia. Companies like Aptiv, Adient, Lear, Johnson Matthey, Joyson Safety Systems, Amphenol, Kostal, Draexlmaier Gentherm, Kemet, Van Hool, Kromberg & Schubert, Marquardt, Dura, and many others, have set up large export-oriented production facilities in the country and several have already reinvested multiple times.

Likewise, recent years have witnessed a number of successful smaller local and foreign ventures in this sector, creating opportunities for further development. Cost-competitive environment, well established aftercare system, free trade access to Europe, and development of infrastructure have made North Macedonia a destination for investment. Additionally, the existence of local supplier base and its ongoing development is creating opportunities for supply chain linkages and local company cooperation.

Current situation in automation components manufacturing

The automotive industry has a very important role for the Macedonian economy in terms of its exports. The automotive companies are largely integrated into the supply chains of the European automotive industry. These are companies that are mostly export-oriented and have a large share in the country's exports.

Prior to the pandemic, the automotive industry was booming in recent years, and it could be credited with increasing exports, creating new jobs and attracting investments. Through these companies manufacturing automotive components, Macedonian economy in recent years has become much more deeply integrated into global supply chains, but also completely changed the export structure, especially in favor of products with high added value.

In 2019, automotive components worth EUR 130 million were exported from the country, which is an increase of 5,6% from the previous 2018. According to the latest data from the State Statistical Office, 65% of the total exports of the country in January 2021 were made by companies in the automotive industry.

Most automotive components are exported to Romania, Germany, Hungary, Slovenia, Mexico and Brazil. Data from the State Statistical Office shows that exports of automotive components are increasing every year. The country's existing manufacturers supply European, Russian, Turkish and African markets.

The automotive industry in these markets is particularly active as global players have invested over EUR 20 billion in car production in Central and Eastern Europe over the last ten years. The quality products produced in these factories, in accordance with the highest automotive standards, assure that the production in the Macedonian sector for automotive components has huge export potential.

These companies have large global reach, exporting to Europe, Russia, Turkey, Africa and around the globe, encompassing a duty-free market of over 650 million customers resulting from three multilateral trade agreements (SAA with EU, EFTA with Switzerland, Norway, Iceland and Liechtenstein and CEFTA with the rest of the Western Balkans) and two bilateral agreements with Turkey and Ukraine. North Macedonia's location allows to deliver to these regions quickly, taking less than a day to Central and Eastern Europe and Turkey and two days maximum to Western Europe.

Automotive components manufacturing perspectives

North Macedonia has a history of automotive components manufacturing, which started in the 1960s initially to supply the former Yugoslavian automotive producer Zastava. Today, the automotive components sector is compiled of a number of companies. The country is particularly suitable as a location for the manufacture of high value to weight and labor-intensive products such as safety systems, electronics, mechatronics, precision engineered and plastic products, and die-casting components. In the recent privatization process, a number of companies have been bought by investors and con-

tinue to produce a range of components for cars, buses, trucks and locomotives.

Investors in North Macedonia can freely export to a market of over 650 million people. North Macedonia offers a particularly cost-competitive operating environment for auto component manufacturing. The labor force is well educated and flexible. The educational system is willing to collaborate with incoming investors in finding ways to meet their skill needs.

Companies like Johnson Matthey, Kromberg & Schubert, Amphenol Technology, Marquardt, Tab Mak, Joyson Safety Systems, Draexslmaier, Gentherm, Lear Corporation, Kostal, Adient, ARC Automotive, Lth Learnica, Adient Automotive, Aptiv, ODW Elektrik, Accomplast, Kablo, Murat Ticaret, Dura Automotive Systems and many others have set up large export-oriented production facilities in the country and have already reinvested several times. Also, in recent years the country has witnessed a number of successful smaller local and foreign ventures in this sector, creating opportunities for further development. Further below we have collected summarised information on major automotive investors to form a comprehensive picture of the current manufacture situation in North Macedonia.

Adient

Adient is a global leader in automotive seating production. In 2017 it opened its new plant for production of automotive seating covers, situated in the technologically developing zone in Strumica.

The new plant has an area of 12 500 m^2 and it is equipped with state-of-the-art technology for production of automotive seating covers, predominantly intended for the needs of customers in the European market. The initial investment amounts to more than USD 20 million for building the greenfield plant. Adient employs 1300 people, additionally confirming its strong commitment to investing in the North Macedonian economy.

Aptive

Former Delphi Automotive, the US company decided to invest EUR 15 million in the Skopje 1 free zone in December of 2015, and currently employs 500 people. The plant produces electronic control technologies for vehicle manufacturers across Europe and works closely with its other facilities in the region to ensure efficiency and flexibility for its customers.

The company's decision to invest in North Macedonia was based on certain criteria, namely following the group's vehicle-maker customers, access to a skilled workforce, use of existing infrastructure, and partnership potential with local government.

In March 2017, Delphi Automotive split its business into two independent companies – Delphi Technologies and Aptiv. Delphi renamed a part of its business focused on automated driving and electrification, calling the new entity Aptiv, which formalized the separation of that aspect of its company from the segment focused on more traditional engines.

Delphi Automotive is among the top 15 largest global suppliers of the automotive industry with an annual turnover of over EUR 17 billion. It has 146 000 employees worldwide with 126 production plants and is operational in over 33 countries.

Draexlmaier

Draexlmaier Group is an international supplier to the automotive industry with more than 60 factories in more than 20 countries around the world. Headquartered in Germany, the company today employs around 75 000 people worldwide.

DMM Draexlmaier Macedonia was founded in 2012 by Draexlmaier Group. In North Macedonia, cable sets (complete electrical systems) for the automotive industry are produced at the request of the client. Since its establishment, the Draexlmaier factory in Kavadarci has experi-

SEE NEWS

HSE to commence construction of largest solar plant in Slovenia

The state-owned power utility Holding Slovenske Elektrarne (HSE) will soon launch construction of what will be the largest solar power plant in the country. The 3,04 MW plant will be built atop a landfill near Hrastnik. The project was announced in June as the HSE said it had obtained the building permit. The foundation stone was laid on 3 July.

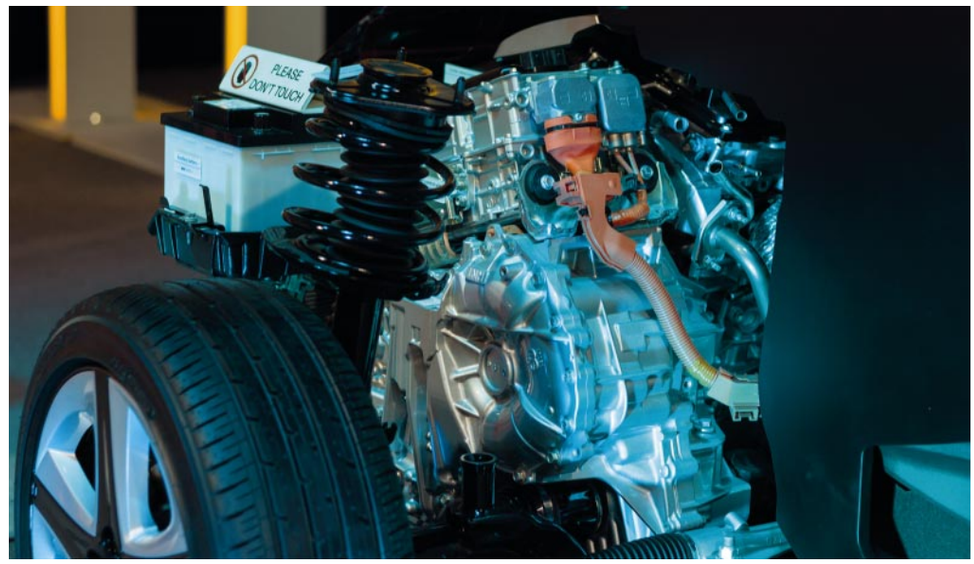
„Prapretno is the first megawatt-plus solar power plant in Slovenia. It will cover the annual demand for electricity of around 800 average Slovenian households," the company said in a press release. The location has a symbolic meaning for the HSE and local community. „In the past, this area was heavily burdened by the electricity production in the Trbovlje thermal power plant and extraction of coal in the nearby mines." Nenad Trkulja, the head of the project, added that the HSE would revive electricity production in the area, but in an environmentally-friendly way, without greenhouse gas emissions.

RiTE Ugljevik and China's BNBM reached final agreement on plasterboard factory

Bosnian coal mining and energy company RiTE Ugljevik said it is about to complete talks with Chinese investor Beijing New Building Materials (BNBM) for the construction of a EUR 50 million (USD 59,5 million) plasterboard production plant.

The draft agreement has already been sent for approval to the government of Bosnia's Serb Republic, which is majority owner of RiTE Ugljevik, the company said in a notice earlier this month. RiTE Ugljevik would hold a 10% ownership stake in the future factory.

According to the plan, the factory will be built on an area of 12,5 hectares at an area adjacent to the company's coal mine and power plant in Ugljevik and will employ about 100 people. The plasterboard plant will use gypsum derived as a by-product at RiTE Ugljevik's recently built flue gas desulphurisation unit. The plant is expected to start operations in 2022.



enced impressive development. Today it is one of the largest employers in the country.

DAA Draexlmaier Automotive of America LLC is a wholly owned subsidiary of the Draexlmaier Group of Germany. The company's main lines of business include interior components, cockpits, wiring harness and electrical management systems. Customers in North America include BMW, General Motors/Cadillac and Volkswagen.

On April 6 2021 Draexlmaier opened a new production plant in Kumanovo, in the northern part of North Macedonia, its second in the country. The company employs over 700 people in the new plant and plans to increase the headcount. Worldwide, Draexlmaier operates more than 65 factories in over 20 countries. The company employs more than 75 000 people.

Gentherem

The U.S. based Gentherm Corporation is recognized by the largest automotive industry manufacturers as a dependable and outstanding supplier of heated seating, climate seating, electronics, and cables. It produces equipment that is installed in dozens of vehicle models by companies such as Ford, General Motors, Toyota, Lexus, and Kia. They have locations in 11 countries, and more than 5000 employees worldwide.

In December 2014, Gentherm Corporation announced it will invest EUR 20 million in a new plant in the Prilep free zone and employ approximately 2000 people. The new facility opened in 2016 and is dedicated to the production of the full line of Gentherm seat comfort and industrial products. As of the start of 2018, 1500 people were employed. This figure is projected to reach up to 2000 people.

Johnson Matthey

British company Johnson Matthey is a world-leading catalyst manufacturer for vehicle and stationary exhaust emission control and a leader in catalytic systems. The company offers modern mobile emission control products and services, such as diesel oxidation catalysts (DOC), active DPF with burner assistant regeneration (DPF-BU), etc.

Johnson Matthey has operations in over 30 countries and employs around 12 000 people. One-third of all new cars worldwide are fitted with a Johnson Matthey autocatalysts. The factory in Skopje generates USD 2,07 billion in sales. There are 198 companies in the Johnson Matthey D.O.O.E.L. corporate family.

The company chose North Macedonia for its European mega-factory for emission control catalysts in competition with 13 other countries in the region, including the Czech Republic, Hungary and Slovakia. Johnson Matthey's plant in the Skopje 1 free zone is the single largest investment project and the most sophisticated and advanced Johnson Matthey plant in the world. The company is also considered the largest exporter in North Macedonia. The investment is worth EUR 80 million and the initial number of employees was 350.

On May 9, 2012, Johnson Matthey marked a major expansion project in North Macedonia with the construction of a second plant located in Skopje 1 free zone. This investment was worth EUR 65 million. It doubled the production and created additional 500 jobs. As a result of Johnson Matthey's expansion, the total number of employees reached 878 at the start of the 2018.

Joyson Safety Systems

Joyson Safety Systems (JSS), formerly known as Key Safety Systems (KSS), is a Chinese-owned company that develops and manufactures automotive safety systems. The company is a result of the merger between KSS and Takata Corporation after KSS acquired Takata. The company headquarters is in Auburn Hills, Michigan, in the United States. Joyson Safety Systems chose North Macedonia in 2014 for its production expansion in Europe. The size of the investment is worth EUR 15 million, and the company initially began with the production of airbag cushions and modules.

The global supplier of advanced automotive safety-critical components and systems started operating in an existing facility in Kicevo as a

brownfield investment in 2015, and from 2016 continued production in a greenfield facility in the Kicevo free zone with an area of 13 600 m^2.

JSS is owned by Ningbo Joyson Electronic, and is described as a „Chinese automotive conglomerate" that acquired Key Safety Systems in 2016. The company is a world leader in the design, development, and manufacture of inflators, airbags, steering wheels, and seat belts. Globally, they have an international network of 34 sales, design, and manufacturing facilities employing approximately 50 000 people worldwide. At the start of 2018, 1426 people were employed in the Kicevo free zone, and this figure is projected to reach up to 2000 people.

Kostal

The German company Kostal is a global leader in the supply of technologically advanced electronic, electromechanical, and mechatronic products for major industrial organizations. Kostal is present at 42 locations on 5 continents and counts a staff of over 18 000 people.

In December 2014, Germany's Kostal announced plans for increasing its production capacity in Europe through an investment in Macedonia. The company began with a brownfield investment in October 2016, in former EMO in Ohrid, with a production facility on 25 000 m^2. The clients of Kostal are famous brands from the automotive industry such BMW, Daimler, Porsche, Tesla, Rolls Royce, Bentley.

At the start of the 2018 calendar year, 221 people were employed and this number is expected to reach 1000. In the future, a significant expansion of production and a total investment of EUR 70 million are expected.

Kromberg & Schubert

Kromberg & Schubert focuses on the development and production of complex wiring systems for the automotive industry. In addition, plastic parts are currently produced. With over 50 000 employees at over 40 locations, Kromberg & Schubert is today one of the global leaders in the supply of electrical systems, cables and plastic components.

Today, Kromberg & Schubert supplies all major automotive manufacturers (OEMs) with a diverse range of electrical systems for cars as well as for motorbikes and utility vehicles: main, engine, cockpit, door, audio, air conditioning and communication harnesses, battery cables as well as overmoulded cable harness modules. This also includes the integration of a number of components into an overall system.

Using the latest technologies and software tools, Kromberg & Schubert simulates an application of the electrical systems during the development to correspond to the individual customer requirements.

Lear Corporation

American company Lear Corporation invested over EUR 15 million in Macedonia's Tetovo free zone on an area encompassing 12 000 m^2. The company uses state-of-the-art machinery and production facilities for cutting leather and canvas, including a contemporary warehouse and office space. At the start of 2018, employees at Lear Corporation's plant in the Tetovo free zone numbered 1390, however through the planned expansion of an additional 8000 m^2, this figure is planned to reach 3000.

Lear Corporation is a leading global supplier of automotive seating and electrical distribution systems. Lear's world-class products are designed, engineered and manufactured by a diverse team of 132 000 employees at 235 facilities in 34 countries around the globe.

Tab Mak

The company TAB d.d. was established in 1965 as a subsidiary of the Mezica Holding Mine Company in an area where they have been dealing with lead for over 350 years. For the first 15 years, the company was a licensed partner of Tudor from Sweden. Today, TAB manufactures a wide range of lead-acid, VRLA AGM and VRLA gel batteries and accumulators in three factories with over 700 employees.

SEE NEWS

Swiss company plans construction of transformer plant in Serbia

Swiss train manufacturer Stadler Rail is considering the construction of a plant for production of transformers in Serbia, President Aleksandar Vucic said. „Stadler, one of the world leaders in the production of rail vehicles from which Serbia will procure three high-speed trains, is also interested in opening a transformer factory in Serbia, as well as in a long-term strategic cooperation in terms of selling trains to our country," Vucic said in a statement published on his personal website after a meeting with company representatives in Belgrade.

In April, Serbia's government signed a EUR 62,2 million agreement with Stadler for the delivery of three high-speed trains, to be used on the Belgrade-Novi Sad railway line, which is being built by Russian and Chinese contractors. The first train will be delivered by October 31st, with the second and third to follow by the end of 2021. Stadler manufacture high-speed and intercity trains, suburban and regional transport trains, light rail vehicles and trams.

Albania announces invitation to tender for the design of cargo port in Durres

Albania's Durres port authority opened a call for bids in a ALL 1,45 billion (EUR 9,2 million) tender for a detailed design of the construction project of a new cargo port in the Porto Romano area, about 10 km north of the country's largest port of Durres. All commercial activities of the port of Durres are to be relocated to the new port, leaving only the passenger terminal in operation, the port authority said in a tender notice published by Albania's procurement agency. The assignment must be completed within eight months, the port authority added.

Local media reported earlier this year that Albania's government has signed an agreement with Emirati multinational real estate development company Emaar for the construction of a marina in the existing port of Durres aimed at attracting tourists in the area. Emaar is expected to invest up to EUR 2 billion in the project that includes also the restoration of the current port area.

North Macedonia receives financing to modernise SMEs and build green homes

The European Bank for Reconstruction and Development (EBRD) is providing two loans of EUR 3,5 million combined to ProCredit Bank Skopje in order to support small and medium-sized enterprises (SMEs) to reach EU standards and residential home-owners to make their buildings more energy efficient. The new funds come at a critical time as private businesses and citizens in North Macedonia feel the economic impact of the coronavirus pandemic.

The first part of the financial package consists of a EUR 2,5 million loan to increase the competiveness of local SMEs. Funds will be lent on to businesses to upgrade their production processes and equipment to EU standards, in particular with regards to product quality and safety, health and safety measures and environmental preservation.

These investments are covered by the Western Balkans SME Competitiveness Support Programme, for which the EBRD provides loans, and the EU – incentive payments and technical assistance. The goal is to help SMEs modernise their activities and take advantage of trade opportunities in the Western Balkans region and the wider European market.

The second part of the financial package is a EUR 1 million loan to support individual investments in green materials, equipment and technologies for privately-owned residential buildings. It comes under the Green Economy Financing Facility (GEFF), which offers energy and resource-efficient solutions to build a greener and more sustainable economy. The programme is supported by the European Union, the Western Balkans Investment Framework and the Austrian Federal Ministry of Finance.


Photo: EBRD

Andi Aranitasi, EBRD Head of North Macedonia, said: „We are very pleased that, together with our longstanding partner ProCredit Bank Macedonia, we can provide additional support to SMEs to invest in the competitiveness of their businesses and to citizens to improve the energy efficiency of their homes. Strengthening the SME sector and investing in green economy are some of our key priorities in North Macedonia and this project will help us come a step closer to both of these objectives. We are also thankful for the support of EU, WBIF and the Austrian Federal Ministry of Finance, all of whom with their grant contributions have helped make the programmes a big success and North Macedonia a regional leader in terms of utilisation of funds under both CSP and GEFF."

Eurasia Packaging Istanbul Fair Hybrid+ sustainable networking through Business Connect

Reed Tuyap Fairs Inc., organizer of Eurasia Packaging Istanbul Fair, presented details on the hybrid format of the fair in 2021. „Exhibitors and visitors will be able to keep in touch with each other virtually and they are still able to connect, network, and do business through the Business Connect Program offered as part of Eurasia Packaging Istanbul Hybrid+. The Business Connect Program provides an online and onsite meeting platform between exhibitors and visitors. Exhibitors are only one click away from their potential buyers or business partners thanks to this virtual program. Within Business Networking Week, a series of industry events and extended online networking will be on the Business Connect Program at Eurasia Packaging Istanbul 2021."

During the Business Networking Week (September 20 – 24, 2021) 3 online events will take place – Printing & Converting, F&B, and Industrial & Consumer Goods. The networking program will allow exhibitors and visitors to send online or onsite meeting requests to each other. Visitors can filter and reach their product of interest easily on this digital platform. Topics during the networking week will include packaging printing technologies, corrugated-paper-carton packaging production technologies, converting technologies. The Food & Beverage online event will focus on packaging products and machinery for food and beverage products. Industrial & Consumer Goods Networking Day covers the topics of packaging products, packaging machinery, and automation for industrial and consumer products.

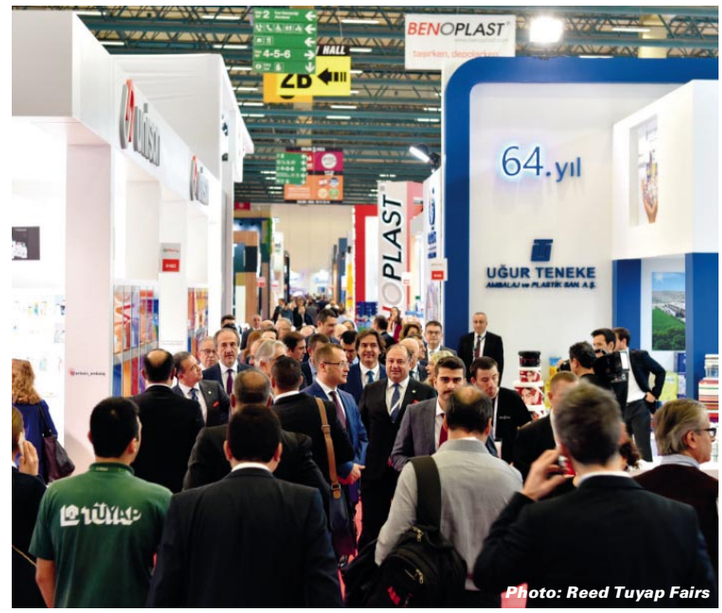


Photo: Reed Tuyap Fairs

Via online networking, between 20 October and 17 December 2021, visitors will still be able to keep in touch with potential customers and business partners for eight weeks after the fair. During this period it will also be possible to reach new customers through the Business Connect Program.

productronica 2021 to take place in-person with comprehensive hygiene concept in place

Trade fair events will once again be possible in Bavaria as of September 1st, 2021. This was announced at the end of June by the Bavarian Ministry of Economic Affairs together with Messe Muenchen. As a result, the world's leading trade fair for electronics development and production can take place as planned from November 16th to 19th in Munich. Companies still have the possibility to take part in productronica 2021 as exhibitors.

The in-person event next fall will also feature a digital supplement in the form of online offerings. Industry representatives will have the opportunity to take part in productronica in person or virtually, regardless of the conditions in place. Falk Senger, CEO of Messe Muenchen, is optimistic about the industry meeting in November: "In the past few months we have been working hard on the safety standards and are now excellently prepared for the new start with an optimal safety and hygiene concept. We are looking forward to once again welcoming lots of exhibitors and visitors to productronica in person."

Messe Muenchen has developed a comprehensive safety and hygiene concept in close cooperation with the relevant authorities. This includes important new elements in addition to basic provisions, such as maintaining the minimum distance, the wearing of FFP-2 masks and the traceability of all participants. This includes the VCR concept: access to the exhibition grounds is only granted to people who have been proven to have been vaccinated, checked or recovered. These data can already


Photo: Messe Muenchen

be entered at the online registration stage. In addition, Messe Muenchen is making test capacities available on site. Modern ventilation systems that guarantee a regular and reliable supply of fresh air provide additional protection for exhibitors and visitors in the exhibition halls.

Nearly five months until the start of the event, more than 500 companies have already confirmed their participation: leading key players such as ASM Assembly Systems, F&K Delvotec, Komax, as well as Kurtz Ersa and Rohde & Schwarz will be represented at productronica 2021.

IstanbulLight scheduled for October 2021

The 13th International Lighting & Electricity Equipment Fair and Congress IstanbulLight is scheduled to take place from 6 to 9 October 2021 at Istanbul Expo Center. The biannual event is organised by Informa Markets under the energy portfolio, and will be held with the strategic partnership of Lighting Equipment Manufacturers Association (AGID) and Turkish National Committee of Lighting (ATMK). It is expected to welcome lighting sector professionals from Turkey, as well as the Middle East, Africa, Eastern Europe, the Balkans, CIS countries. Visitors will have the opportunity to learn more about the latest products and solutions of manufacturers and importers of technical lighting, decorative lighting, lamps, auxiliary lighting equipment, lighting automation systems, as well as the current lighting design trends.

IstanbulLight also offers a rich events programme, including important sectoral discussions with speakers from public authorities, international and national companies and associations. The program also features the IstanbulLight Lighting Congress, the IstanbulLight Lighting Design Summit and Commercial Stage activities, aimed to add value to the sector as well as to bring an opportunity to gather professionals together with experts under one roof of the three day exhibition.

Visitors include representatives of ministries, municipalities and public, investment managers, public and private investors, construction contractors, electric lighting contractors, facility managers, electric lighting importers/wholesalers, etc. Top 10 visitor countries at the 2019 edition were Morocco, Algeria, Bulgaria, Libya, Tunisia, Iraq, China, Iran, North Macedonia and Egypt. The exhibition's 12th edition was visited by a total of 7757 people over four days, including 969 foreigners from 77 countries.


Photo: Informa Markets

„Under the roof of IstanbulLight you will find the best quality products and the best lighting solutions from 350+ exhibitors. As the region's only gathering of lighting industry professionals, visitors can learn more about new technologies, observe the latest trends and market development and expand their business by meeting new potential customers or partners", said organizers Informa Markets.

Companies in this issue

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