EIPC NEWS

EIPC ANNOUNCE THEIR 3rd TECHNICAL SNAPSHOT WEBINAR

We have been organising Technical snapshot webinars which will are of particular interest to those involved with automotive, telecom and high-speed technology. For the upcoming webinar, we will have three well-known PCB industry speakers, each of whom has their own view on the technology challenges facing this industry.

The upcoming webinar is scheduled on:

Wednesday December 16th.

The webinar will last for 45 minutes with each speaker taking 15 minutes for their presentations and then the webinar will be open for questions and comments from the participants.

Start webinar December 16th: 15.00 hrs

The presenters on this day will be confirmed asap.

Register online or send an email to kwestenberg@eipc.org

EIPC Technical Snapshot: Market Analysis and Advanced Manufacturing Tech

November 30, 2020 | Pete Starkey, I-Connect007

Only John Ling could have composed the invitation: “An EIPC webinar is just like one of their conferences, except that you do not have to travel, you do not have a beer with colleagues, you do not enjoy excellent food, and you do not enjoy convivial company. But we do not live in normal times, and some things are not the same. Manufacturing PCBs, however, remains comfortingly complex, so on November 18, 2020, at 1500 hours CEST, EIPC will hold a webinar at which three very reassuring gentlemen will help matters become a little clearer.”

In a well-attended Zoom meeting, EIPC president Alun Morgan introduced an outstanding webinar programme combining knowledgeable market analysis and advanced manufacturing technology. Thanks to Zoom, we had the benefit of a remarkably detailed inside-line view from Asia, as Prismark Managing Partner Dr. Shiuh-Kao Chiang reflected on a market that contrasted radically with original predictions and discussed key factors affecting its future direction and momentum.

2020 would certainly be a year to remember! The global electronics and PCB industries were acutely traumatised by the pandemic: PCB production patterns and demand expectations were substantially distorted. Originally a very strong year had been anticipated, when 5G was expected to create tremendous demand in smartphones and base stations, with a consequential increase in demand for high-end circuit boards. The pandemic forced a revision of the forecasts, and at the beginning of the year, a drop of 5–6% in the global economy had been predicted, with historical experience suggesting that the PCB industry would suffer as badly as it had in 2008, when a double-digit decline was followed by a global recession with a huge impact on the electronics and PCB industries.

 But it did not turn out as badly as feared. The effects of work-from-home and the change in behaviour patterns effectively saved the electronics industry, with people continuing to purchase durable goods. And there remained a robust demand for semiconductors, resulting in the PCB industry seeing substantial growth in the demand for packaging substrates. Even though there had been a disruption of production and logistics and an evaporation of the demand for many consumer products, the effect on the PCB industry was limited in terms of the total value, but it was not uniformly distributed. Some sectors saw tremendous impact while others had been relatively undamaged.

Because of work-from-home, the computer market had been very strong, but the lock-in caused automotive demand to drop sharply. The markets for conventional consumer products and mobile phones were weak, but advanced consumer products—like wireless headphones, new gaming consoles, and smart wearables—were resilient. The analysts were predicting that the PCB market would see an overall growth in value of about 4.4% in 2020, with the majority coming from packaging substrates. The HDI market was also relatively good, although no growth was expected in conventional multilayers or rigid boards.

2020 could actually be seen as a positive, with the computer side as the strongest driver, which came as a surprise since the market had been in decline for the previous ten years, both desktop and notebook. As a consequence of work-from-home, it was no longer a case of one computer per home but one per person, and similar for tablets. A significant demand had been created for 4-, 6- and 8-layer boards, together with substrates for CPUs, GPUs, and AI devices. The server and data-centre market also continued to increase.

On the negative side was the huge drop in automotive. The medical sector had been steady, and some very strong growth had been seen in military, particularly in the U.S. The mobile phone market was interesting. Although the volume was forecast to decline by about 8%, the HDI, flex, and substrate value within each phone was increasing because 5G and high frequency required completely new RF modules and increased interconnection density.

For 2021 and beyond, the industry would continue in a transforming, recovering, and growing mode, with positive expectations for the PCB market. Substrates would continue to become more sophisticated, and leading substrate manufacturers had made billion-dollar investments. Demand for HDI would continue to grow, not just for the 5G smartphone but also because it was becoming the popular technology for

many other applications, including consumer products, and local Chinese PCB shops were putting a lot of investment into HDI. High-speed, high-frequency applications were driving the demand for rigid multilayers in low-loss materials.

The pandemic had renewed the debate about the benefits of localisation versus globalisation for the security of supply and provided a stark reminder that we will never know what's going to happen five years in the future!

 Mike Vinson, chief operations officer at Averatek, described a novel semi-additive process based on a proprietary palladium surface activator for electroless metallisation and capable of producing extremely fine lines and spaces with minimal loss of conductor cross-section on flash-etching, offering significant benefits in signal integrity and impedance control. The process was currently capable of producing lines and spaces of less than fifteen microns, and sub-five-micron capability was in prospect. Ultimate resolution was limited only by photolithographic considerations.

The key feature was a non-aqueous surface coating treatment yielding a dense, coherent deposit of palladium, only a few nanometres thick. These characteristics offered significant advantages over traditional palladium catalysts in terms of coverage and adhesion, and enabled continuous metallisation to be achieved at minimal deposit thickness. The primary function was in providing an ultra-thin base layer of electroless copper on laminate for semi-additive manufacture of printed circuits on rigid or flexible substrates, although the treatment could also be used to metallise a variety of cavities, channels, and three-dimensional surfaces, as well as to facilitate the plating of copper on aluminium, ceramics, and textile materials.

The metallised coating could be imaged using photo-lithography and other printing techniques. Alternatively, it could be directly patterned using a laser or by selective blocking. After pattern plating and resist stripping, there was very little copper to remove at the flash-etching stage; therefore, the conductor cross-section was accurately maintained, enabling close control of impedance and allowing precise inductive and capacitive coupling across narrow spaces.

It was claimed that the process could dramatically reduce the area, layer count, and weight of electronics systems, as well as provide significant RF benefits. It had been designed to be easily integrated with traditional PCB manufacturing equipment and materials, and the coating retained its adhesion and activity through multiple processing steps. It was well suited to improving microvia reliability, and high-density copper traces could be used to reduce or eliminate microvia issues. It was

successful in plated through-holes and had been used to metallise silicon vias with diameters as small as 40 nanometres.

Averatek was working closely with major laminate suppliers to determine compatibility with a wide range of rigid and flexible materials: standard, mid-loss, and low-loss. Vinson showed composite coupons for high-speed passive circuit testing and preliminary RF analysis of microstrips, differential pairs, and resonance structures. Averatek's process had been licensed to multiple commercial manufacturers.

The rapid implementation of HDI technology has focused increased attention on the thermo-mechanical reliability of stacked microvias. Factors like base material properties, lamination and drilling parameters, de-smearing, and electroless copper activation had been extensively studied. Research by Atotech indicated that the detailed formulation of the copper electroplating process significantly influenced the nature of the metal deposited on and near the surface and that subtle differences in the co-deposition of additives played an important role in determining the integrity of the interface between stacked micro-vias. Roland Herold, Atotech senior specialist in electroplating, gave an overview of the latest findings and developments.

How could the bond be improved? His Ishikawa diagram was indeed "a fish with many bones," but he chose to focus on the functions and purposes of essential additives: halides, brighteners, levellers, and carriers, and the extent to which these could be preferentially co-deposited at or near the interface. Clearly, the surface of the electroless copper at the target pad needed to be perfectly clean to enable the best metallic bond to be achieved by undisturbed epitaxial copper crystallization, but even when the prior processes were perfectly under control, it was possible for components of the electroplating process itself to effectively contaminate the target pad surface and thus weaken the metallic bond.

Herold described the chemistry of organic additives, which typically contained sulphur and nitrogen in combination with carbon and oxygen and were normally associated with chlorine, and discussed methods by which they could be detected and measured. Dynamic secondary ion mass spectrometry (dSIMS) had been successfully used as an analytical technique for investigating failed interfaces. He gave a detailed account of electrodeposition mechanisms to explain the interaction of brighteners,

carriers, and levellers and their influence on the initiation and growth of copper crystal structure. A fascinating lesson in theoretical electrochemistry!

Investigational work at Atotech had demonstrated that leveller compounds could be co-deposited onto interfaces and into the electrodeposited copper deposit, synergistically with the brightener, and the rate of co-deposition of additives was highly dependent on their chemistry. The co-deposition of additives could be controlled to a low level by careful choice and balance of chemical composition, together with optimisation of operating temperature, current density, and reverse pulse frequency, as well as the configuration and maintenance of the anode system.

After a question and answer session, Alun Morgan thanked the presenters, the organisers, and the participants, and brought EIPC's very successful and extremely informative second technical snapshot to a close. The next one in the series is planned for December 16.

The European Institute for the PCB Community

EIPCSPEeDNEWS

Issue 29 – December 2020

NEWS FROM GERMANY

Schweizer Electronic AG: Another milestone reached in the new high-tech PCB plant in Jintan (China) with successful conclusion of VDA 6.3 audit

After the new Jintan plant (China) received its ISO 9001 certification at the beginning of the year, another important milestone for supplier qualification of the automotive market has been reached with the successful completion of the VDA 6.3 audit in Jintan. This is a further step towards successful certification in accordance with IATF 16949 (Automotive), which is scheduled to take place at the beginning of 2021.

"With the successful certifications at our Jintan plant, we see ourselves as a very reliable partner for our customers. Despite the pandemic-related difficult audit conditions with which we have to work both in China and Germany, we were also able to successfully achieve recertification in accordance with IATF 16949:2016 (Automotive) at the Schramberg site this year. SCHWEIZER has been able to successfully maintain certification in accordance with IATF 16949:2016 and the previous certification in accordance with ISO/TS 16949 for more than 10 years. With our two production plants in Germany and China, we are therefore well positioned for the different requirements of all market segments for the future," emphasises Nicolas Schweizer, Chairman of the Executive Board of Schweizer Electronic AG.

About Schweizer Electronic AG:
Schweizer Electronic AG, founded in 1849 and led by the 5th and 6th Generation of family members, stands for state-of-the-art technology and consultancy competence. SCHWEIZER's high-tech printed circuit boards and innovative solutions and services for automotive, solar, industry and aviation electronics address key challenges in the areas of Power Electronics, Embedding and System Cost Reduction. Its products are distinguished for their superior quality and their energy-saving and environmentally-friendly features. Together with its partners WUS Printed Circuit (Kunshan) Co., Ltd., Meiko Electronics Co. Ltd. and Elekonta Marek GmbH & Co. KG the company offers in its division electronics cost- and production-optimized solutions for small, medium and large series. Together with its partner Infineon Technologies AG, SCHWEIZER jointly taps the chip embedding market. The company was founded by Christoph Schweizer in 1849 and is listed at the Stuttgart and Frankfurt Stock Exchanges (ticker symbol „SCE", „ISIN DE 000515623").

The European Institute for the PCB Community

EIPC SPEeDNEWS

The Weekly On-Line Newsletter from the European Institute of Printed Circuits.
Issue 29 – December 2020

NEWS FROM THE UK

1 week to go until the

IMAPS-UK/IEEE-EPS Thermal Management Online Conference

Wednesday 25th and Thursday 26th November 2020

· **End User Needs** – challenges in **Automotive Electric Powertrain (BMW Group)** and **Industrial Motion Control Products (Siemens)**
· **Passive Cooling** – overcoming thermal management issues through advanced **Thermal Interface Materials** and processes
· **Active Cooling** – thermoelectric generators, additive manufacturing, heat pipes
· **Measurement and Testing** – ensuring reliability/fitness for purpose
· **Simulation** – shortening the design and validation cycle

Organisations presenting include:
BMW Group, **ASE**, **Indium Corporation**, **NPL**, **University of Greenwich**, **Siemens**, **MTC**, **Hieta**, **Columbia Staver** and **Mentor**

Free for IMAPS and IEEE-EPS UK and Ireland Members *
£50 (exc VAT) for Non-Members of IMAPS **
*** Free to Attend for the following categories of IMAPS-UK Members (Individual, Corporate, Academic, Student), Members of IMAPS Worldwide and IEEE-EPS (UK and Ireland) Members**
****Non-Members of IMAPS (including those only registered on IMAPS-UK website)**

Register Here

For any other details or information please contact:

IMAPS-UK Secretariat
125 High Street Chesterton
Cambridge CB4 1NL UK
Tel: +44 0131 2029004
e-mail: Office@imaps.org.uk

MicroTech 2021 Annual Online Conference
"Heterogeneous Integration"

CALL FOR ABSTRACTS

Thursday 25 March 2021

HETEROGENEOUS INTEGRATION – PACKAGING FUTURE MICROSYSTEMS

IMAPS-UK invites **Abstracts** which describe the latest advancements in package design, materials, next level integration and performance that will affect microelectronic packaging for future microsystems.

X

Markets and Developments	Integration	Materials	Design & Test
High Performance Computing	Single chip and multi-chip	Emerging Research materials	Co-Design
Internet of Things (IoT)	Photonics	Emerging Devices	Modelling and Simulation
Automotive	Power Electronics	Thermal Management	Test Technology
Aerospace and Defence	MEMS and Sensor	Wafer Level Packaging	Security
Mobile	5G	Interconnects for 2D and 3D structures	
	SiP and Module System		

THOSE WISHING TO PRESENT THEIR WORK AT MICROTECH 2021 SHOULD SUBMIT AN ABSTRACT OF APPROXIMATELY 200 WORDS BY FRIDAY 18TH DECEMBER, ELECTRONICALLY TO: *OFFICE@IMAPS.ORG.UK*

Further Information on MicroTech 2021 - Click Here

Don't miss our next event .....

The Thermal Management Online Conference ..... 25 and 26 November 2020

Less than 1 week away ....have you booked your place?

Click Here to Book your Thermal Management Online Conference Place

---

For Any other details or information Please contact:
IMAPS-UK Secretariat
125 High Street Chesterton, Cambridge, UK
Tel: +44 0131 2029004
e-mail: Office@imaps.org.uk

The European Institute for the PCB Community

EIPC SPEeDNEWS

The Weekly On-Line Newsletter from the European Institute of Printed Circuits.
Issue 29 - December 2020

NEWS FROM THE USA

Bill Gates Predicts That 50% of Business Travel and 30% of Office Life Will Disappear in the Post-Covid-19 Era

According to the founder of Microsoft, companies will begin to question taking a trip "just to discuss things."

.

- According to the founder of Microsoft, companies will begin to question much more the fact of taking a trip "just to discuss things."
- Business trips will be reduced by more than 50% and more than 30% of office life will disappear.

COVID-19 arrived and caused us to rethink the ways we work. The *home office* grew exponentially and business meetings turned into business video calls. It is no secret to anyone that the hybrid model is here to stay.

Against this background, Bill Gates predicted that in a post-SARS-CoV-2 era business travel will be reduced by more than 50% and more than 30% of office life will disappear. The businessman made these remarks at *The New York Times DealBook conference.*

According to the founder of Microsoft, companies will begin to question much more the fact of taking a trip "just to discuss things", so it is likely that travelling for business will cease to be common.

"We will continue to go to the office and we will continue to do business trips, but much less," said the billionaire. In October, his tech company announced to its employees that they could work from home permanently for at least 50% of their working hours.

.

News from
WECC members

WECC
World Electronic Circuits Council

Issue 29– November 2020

NEWS FROM THE IPC

PC Drives Collaboration, Transformation, Modernization; Launches Factory of The Future Initiative

To help the electronics manufacturing industry harness the full potential of smart factory/Industry 4.0 technologies, IPC has launched its Factory of the Future initiative. The framework is intended to drive the industry forward by promoting and accelerating modernization; helping to *Build Electronics Better.*

Building upon 20 years of conventional technology advancements with emerging/disruptive technologies such as digitization, 3D printing, robotics, cloud computing, and equipment data communications, IPC is bringing factory of the future solutions providers together with original equipment manufacturers, EMS companies, and PCB fabricators focused on identifying and solving business challenges important to their companies and supply chains. Target outcomes from new collaborations include improvements in quality, reliability, efficiency, productivity, new product introduction cycles times, and manufacturing operations security enhancements. The model fosters industry-wide modernization by developing new standards, workforce education modules, industry events, and advocacy efforts.

Elements of the initiative include strengthening industry workgroup collaborations (AIAG, PSMA, MTC, HDP, INEMI); addition of new factory of the future technology solutions providers; Chief Technologist Council insights to obtain “voice of customer” input and continuously monitor IPC member manufacturing technology needs; CFX implementation on the shop floor; digital standards portfolio development and growth; and expanded education and training offerings.

“To date, there hasn’t been a clear path on how to implement Industry 4.0 leaving companies paralyzed with information overload and wondering how to make use of

innovations that will deliver real value to their business," said Matt Kelly, IPC chief technologist and initiative lead. "Taking a leadership role, IPC, through its partners and member base will help industry move beyond Industry 4.0 concepts by shifting to implementation of new/emerging technologies, thus modernizing factories, operations, and manufacturing/business processes. IPC will focus its efforts on building common industry building blocks benefiting the entire electronics industry supply chain."

IPC President and CEO John Mitchell echoes Kelly's points, "This initiative is very much implementation focused. Our goal is to drive a unified, standardized, and simplified factory of the future industry transformation. Currently, we are working on defining a new factory of future standards category which will include the following areas: connected factory, cybersecurity, digital twin, blockchain, traceability, model-based design, and PCB/PCBA manufacturing data and transfer methodology. IPC is absolutely investing in the electronics industry's future. It is our goal to be the go-to association helping companies transform and modernize."

For additional information on IPC's Factory of the Future initiative, visit. www.ipc.org/ipc-factory-future.

EIPC SPEeDNEWS

Issue 29 — December 2020

International Diary

2020

HKPCA Exhibition
2-4 December
Hong Kong, China

EIPC Technical Snapshot Webinar
Registrations via www.eipc.org
16 December

2021

IPC APEX EXPO
March
San Diego, USA

EIPC @ SMTconnect
4-6 May
Nuremberg, Germany