



The European Institute for the PCB Community

EIPC NEWS

EIPC ANNOUNCE THEIR TECHNICAL SNAPSHOTS

An EIPC Webinar is just like one of their Conference, 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, and so on

18th November 2020 at 1500 hours CEST

EIPC will hold a Webinar at which three very reassuring gentlemen will help matters become a little clearer.

In the 45-minute session, moderated by our Chairman Alun Morgan, we will hear from **PRISMARK Dr. SHIUH-KAO CHIANG**, who will show how the pandemic has substantially distorted PCB production patterns and demand expectations. He will reflect on the 2020 PCB market and discuss the various key factors that drive or alter the market momentum.

Prismark Abstract:

2020 is a year to remember. This is probably the first time that the global electronics and PCB industries are deeply impacted by an infectious disease. Furthermore, the pandemic has substantially distorted PCB production patterns and demand expectations. As a result, the 2020 PCB market is very different from originally anticipated. In this presentation, Prismark will present its views on the 2020 PCB market and discuss the various key factors that drive or alter the market momentum.

MIKE VINSON from Averatek will look at how the availability of thinner high-performance materials brings many advantages to board layout and design without affecting impedance requirements.

Averatek Abstract:

The trace size on today's high speed circuits are often limited by impedance matching and dielectric thickness. Semi-Additive PCB fabrication enabling smaller, more accurate traces with straighter more precise trace sidewalls in combination with the availability of thinner high-performance materials bring many advantages to board layout and design without affecting impedance requirements. This presentation will discuss the A-SAP™ process and its impact on signal integrity and PCB design.

From ROLAND HEROLD of Atotech, who will underline the importance of reliability when plating electrolytic stacked blind micro vias (BMVs), and give an overview about the latest findings & developments in electrolytic copper.

Atotech Abstract:

The continuously increasing thermo-mechanic reliability requirements for e.g. automotive electronics and 5G hand-held PCBs needs a better understanding of all production processes.

Apart from the contribution of the well-known factors like base material properties, pressing/lamination & drilling conditions, de-smearing & deposition parameter of the conductive seed layer, the set-up of the electrolytic copper process plays an important role in advanced interface reliability between stacked micro-vias.

The webinar introduces into the gives an overview about the latest findings & developments in electrolytic copper.

There will be a Q&A session after the last speaker.

For EIPC members the seminar is free of charge; for non-members the fee will be € 50,-

Please contact us to reserve your place.

To register for November 18th please fill in the online registration on www.eipc.org or send an email to kwestenberg@eipc.org

Review

An Update on Walt Custer's EIPC Business Outlook Webinar

I-Connect007 have published Mr. Pete Starkeys write-up of Walt's webinar held on October 2nd, 2020.

[Link to Walt Custer's webinar on October 2](#)

“We’re not out of trouble yet, but it’s a whole lot better than a couple of months ago.”

Walt Custer’s business outlook update, with emphasis on the European electronics industry, attracted a capacity audience to EIPC’s webinar on October 2, and it wasn’t all bad news. As Custer said, “It was really bleak earlier in the year. There was nothing positive that we could say in March and April. But now, business conditions are finally improving again.”

Introduced by Alun Morgan, EIPC president, Custer presented his current assessment of the global electronics industry with a focus on Europe. “We’re definitely not out of it, but it’s a whole lot better than it was 60–90 days ago,” Custer said.

Reiterating earlier concerns about the 2020 economy, he remarked that the global manufacturing decline had been made worse by coronavirus-driven shutdowns and continued tariff, trade, and Brexit issues. Geopolitical concerns have also remained very

significant, and service and travel sectors remained in a major recession. But European business conditions were improving, manufacturing was recovering, and industrial production was currently at a much better level than it had been a couple of months previously.

Global Purchasing Managers' Indices (PMIs), which Custer considered useful and timely leading indicators, point toward expansion in most areas of the world. The European index had risen to 53.7 for September after a long period below 50, indicating that the manufacturing sector was showing the strongest growth for two years, particularly in Germany. European electronic production, which had crashed in the first and second quarters of 2020, was now back close to its former level, and the worst appeared to be over.

The automotive market was a lynch-pin of Europe's electronics sales and suffered badly. Vehicle production plummeted in the first quarter and early second quarter. It's now recovering, but it will probably take a long time to reach its former levels. The same was true of the U.S. automotive industry. Vehicle production had fallen almost to zero in the spring of 2020. It was beginning to improve, but still had a way to go.

The aerospace sector, both in the U.S. and Europe, suffered similarly. In Custer's opinion, it was starting to turn the corner, but he did not expect it to recover quickly. Production in the control and instrumentation sector had been down by about 11% worldwide, and similarly in Europe, but had recovered about half-way. The medical sector had been down 18% but was now almost back to its earlier level. Overall, European electronics assembly had recovered about three-quarters of the way back from the collapse in early 2020.

The semiconductor industry, although highly cyclical, was beginning to show a little growth. Worldwide shipments to regions were a measure of electronic assembly activity. Shipments to Europe, which had been steady at about 8% for the previous couple of years, were down by about 20% in the first half of the year but were expected to increase in the second half.

Semiconductor manufacturers in China, Taiwan, and South Korea had continued to invest in capital equipment. Turning to the global PCB market, Custer's data indicated that although Chinese and Taiwanese output had dropped at the beginning of 2020, it was now back above the trend line as it entered the annual busy season. South Korean PCB industry appeared to be still suffering the impact of the coronavirus pandemic. Japanese production remained relatively flat. North America had seen a flurry of increased activity in the spring as people switched sources from Asia and started buying PCBs locally.

Custer's detailed analysis of the European PCB industry included an abundance of information and comment generously shared by Michael Gasch and Hans Friedrichkeit, which he acknowledged appreciatively. European PCB production in 2019 was worth about 1764 million euros, of which Germany represented 43%, Austria and Switzerland 17%, Italy 12%, and the U.K. and France about 8.5% each. Production had been basically flat since about 2007. It had fallen 8% in 2019, and would probably fall another 10% during 2020. The principal end markets remained industrial, medical, and aerospace.

The number of European manufacturers continued to decrease and totalled 187 in 2019. Based on sales, Michael Gasch listed his top 41, the leaders being Würth-group, AT&S, KSG-group, Schweizer Electronic, and Elvia. In his notes on the challenges of 2020–2021, Gasch commented that coronavirus would remain for quite some time, and it would not help either the people or the economy if politicians downplayed the danger. The U.S. had about

4% of the global population but more than 20% of all infections and fatalities. Four states—California, Illinois, Michigan, and Texas—had 27% of all cases but almost half of the U.S. PCB production. In Europe, by comparison, France, German-speaking countries, and the U.K. had 28% of all coronavirus cases but made 84% of all PCBs.

Gasch foresaw that as soon as the situation came closer to normality, there would be a wave of bankruptcies, a huge wave of mass layoffs, and an economic crisis all over the world. The outcome of the U.S. elections would have, either way, an influence on the world economy, and the U.S. trade war would cost the U.S. economy billions of dollars. Brexit would result in additional costs to the U.K., where protectionism, agreements, and contracts would no longer have any value.

He remarked that all principal industrial segments served by European PCB manufacturers were under pressure: industrial electronics in Europe would decline by 20% in 2020, the global automotive market would lose 24%, and new aircraft would no longer be needed because of a large second-hand market. He estimated that the European PCB industry in 2020 might reach just 1,950 million USD, down 10–13% versus 2019, and 6% below the 2009 output.

All of these experiences would lead to the realignment of supply chains. Labour was no longer cheap in China, and Southeast Asia might follow soon. Political decisions and relocating in Southeast Asia would postpone the problems and increase costs. In Gasch's opinion, a better decision would be to relocate closer to the markets, thus increasing flexibility and security of supply, and certain costs might not rise at all.

Hans Friedrichkeit's summary of the situation in the European automotive industry began with a lot of bad news. The position at automotive suppliers remained very tense, and the coronavirus was accelerating the relocation of production and job cuts. He reckoned that half the suppliers in the automotive industry expected that pre-crisis levels would not be reached again until 2022, some not even until 2023, and six out of 10 supplier companies were planning staff cuts due to the coronavirus crisis.

Friedrichkeit quoted some figures. Continental had been cutting 13,000 jobs, Schaeffler 4,400, and Bosch 2,000. An extension of government-financed short-time working would help to slow down the loss of more jobs. In Germany, 65% of car manufacturers and suppliers had introduced short-time working in August. However, the number of short-time workers in Germany, which had been 4.7 million in August, fell to 3.7 million in September, and employment in the industry continued an upward trend.

The prospect of the U.K. leaving the European Union without a deal would have a catastrophic impact, with WTO tariffs putting the production of some three million EU- and U.K.-built cars and vans at risk over the next five years. "No deal" would lead to combined EU-U.K. trade losses worth up to 110 billion euros to 2025, on top of around 100 billion euros in lost production value so far in 2020 because of the coronavirus crisis.

But Friedrichkeit did have some good news for the automotive sector. In August, new registrations of electric cars in Germany had risen by 308% to 33,203 vehicles, representing a record 13.2% share of the total market. Plug-in hybrids had shown impressive growth in August, up by 448% to 17,095 units. In the first eight months of 2020, new registrations of electric cars had amounted to 163,139, corresponding to 9.2% of all new passenger car registrations.

Optimism was growing among German exporters, and the upturn in industrial production in many important customer countries would benefit the German export industry. Manufacturers of electrical equipment expected their exports to grow in the fourth quarter, as did the automotive industry. In contrast, the mechanical engineering sector did not expect any major increase.

In Friedrichkeit's review of the fortunes of the European PCB manufacturing industry, he observed that in the first quarter of 2020, manufacturers in the Germany, Austria, and Switzerland region had reported a 7.5% drop in sales compared with 2019, and in the second quarter German manufacturers had seen a 17.4% drop in sales compared with the equivalent period in 2019. German PCB production had shrunk about 10.4% to 752 million euros in 2019, following 839 million euros in 2018 and 788 million euros in 2017. For the full year of 2020, an overall sales loss of -18% for Germany could be assumed, corresponding to about 620 million euros. Leading German manufacturers were reducing their staff.

Thanks to its global diversification in the high-end PCB sector AT&S was one of the few PCB manufacturers to come through the crisis relatively well. Compared with 2019, its second-quarter turnover had grown 11.3%.

Friedrichkeit's outlook for 2020–2021 was that despite lowered economic forecasts, the global megatrends in the electronics industry as a whole would remain—particularly due to ongoing digitization, the new 5G mobile phone standard, and the rapidly growing data volume.

Custer echoed the concerns highlighted by Gasch and Friedrichkeit, commenting that the problems were unlikely to go away overnight and estimating that the overall European PCB industry could be down 10–13% for the full-year 2020. Supply chains had gotten shaken up, and people were starting to look for sources other than China for low-cost manufacturing. Political decisions had muddied the water, and the automobile industry was in a state of flux, although the rapid progress in the electric car business was good news.

Changing subjects, he looked at world figures for the supply side of the PCB industry: process equipment, materials, and laminates. In the second quarter of 2020, process equipment sales had increased by about 2%, which was remarkably good considering the circumstances. Materials suppliers' sales had fallen about 16%, and laminate sales had increased by about 1%. In his world model, PCB shipments per month were slightly up, mainly due to the seasonal build-up in Asia, but Europe was "down there with the rest."

World Bank forecasts for GDP growth predicted that Europe would be down 9% for 2020 then increase by 4.5% in 2021. Restating the concerns about the 2020 economy he had listed at the beginning of his presentation, the global manufacturing decline had been made worse by coronavirus-driven shutdowns; automotive and aerospace production had been hit particularly hard; service and travel sectors remained in major recession; tariff, trade, and Brexit issues continued; and that geopolitical concerns remained very significant. Once again, Custer made it clear that business conditions were improving, manufacturing was recovering, and industrial production was currently at a much better level than it had been a couple of months previously. And it was encouraging that the PMI for Eurozone manufacturing was currently indicating positive growth.

Morgan thanked Custer for his most informative presentation and reminded the audience that, after 50 years in the industry and many years as a director of the EIPC, Walt was retiring from active service and phasing-over the lead of his consultancy to his son Jon.

I also want to add my personal thanks to Walt for all of the wisdom and the wealth of data and market analysis he has provided over all the many years. I have been privileged to be a member of your audience. Enjoy your retirement!

Pete Starkey
I-Connect007



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NEWS FROM ELECTRONICA

Empower Your Circuit Design Innovation at the Maxim Integrated Virtual Booth—electronica 2020

Develop Smaller, Smarter, More Secure Designs

We're an engineer's engineering company—which means that we solve the toughest circuit design problems to empower your design innovation. To help you quickly develop smaller, smarter, and more secure products, we're launching our Virtual electronica 2020 experience packed with opportunities for you to deepen your expertise. Dive into demos, gain deeper insights into technologies through our series of webinars, and meet with our team starting on November 9.

Click on the tabs below for a sneak peek at what you'll experience at our virtual booth, to register for the webinars, and to schedule an online meeting with us. We can't wait to see you online!

[Register for our Virtual Booth >](#)

[Request a Meeting >](#)

Empowering Intelligence at the Edge

Maxim's intelligent sensors, software-configurable IOs, and diagnostics technologies are pushing intelligence to the edge, enabling safe, fault-tolerant industrial systems that can gather higher quality information in real-time, at the edge of the network. Compact, highly integrated power modules, isolated power, and power protection ICs ensure that these systems operate efficiently, safely, and reliably. As our industrial communication and industrial power ICs continue to get smaller while delivering increasingly greater levels of integration, power efficiency, and robustness, they're proving to be the lifeblood of industrial convergence.

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- Factory Automation with Go-IO
- Intelligent Sensors for Industrial Automation
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- Himalaya DC-DC Converters—The Peak of Cool
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- DC-DC Isolation with Lower Cost While Saving Space

Webinars

- New IO-Link Transceivers Make Sensor and Actuator Designs Easier
- The Latest Technologies in Driving Stepper Motors
- Create Cooler, Smaller and Simpler DC-DC Power Supply Solutions Without Being an Expert
- Protect Your Power System Designs Against Faults Like a Pro
- How to Increase Runtime and Reduce Size of Solar-Powered IoT Devices

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Maxim Integrated
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San Jose, CA 95134 USA

Contact us: eventsteam@maximintegrated.com

The world's smallest particle sensor

In Europe alone, more than 400,000 people die each year due to exposure to fine particulate matter. A tiny, energy-efficient measuring sensor for mobile devices could save lives over the long term.

The world's smallest sensor is the size of two one-cent coins stacked on top of each other. It is a feature that makes it something more than simply very energy efficient. With dimensions of 12 mm by 9 mm by 3 mm, it fits nicely into smartphones, smartwatches and fitness bracelets. For the very first time, the devices can continuously monitor ambient air and immediately react if the amount of fine particulate matter reaches dangerous levels. Joggers and individuals headed to work could then avoid the most problematic areas.

The sensor could be used in a similar way in local applications at home or during outdoor activities, times when the device can provide an unheard of amount of data. This data could also serve as the basis for other regulatory measures and raise people's awareness levels about the problem of fine particulate matter.

Low priced and tiny

Paul Maierhofer is the expert behind this "puny" innovation. He developed it while working on his dissertation at the Technical University of Graz in Austria along with specialists from the semiconductor maker ams and researchers at Silicon Austria Labs (SAL). The "Graz" particle sensor fills a gap. Until its invention, tightly meshed, national monitoring of air

quality was foundering, the victim of the size, complexity and cost of measuring sensors available at the time.

In their project, the researchers drew on the well-known processes used in conventional measuring equipment as well as state-of-the-art production and integration methods. At this degree of miniaturization, the sensor has bumped up against the limits of the physically and technically feasible. The price sought by the semiconductor maker ams should be significantly below that of currently available products.



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NEWS FROM THE FED.

FED

Fachverband für Design,
Leiterplatten- & Elektronikfertigung

The FED is offering two interesting online seminars:

Online seminar: Test procedure for electronic assemblies (October 29th - October 30th)

Online seminar: LP technology in theory & practice (23 + 24 November 2020 and 30 November + 01 December 2020)

You can find more information about the individual dates under the links. If you are also interested in classroom training, you can find our course offerings at the bottom of the newsletter or on the FED website.

FED RG Berlin: Online lecture on the topic of selective soldering processes.

On November 12th at 10 am, the Berlin regional group will offer you an online lecture on the subject of "Which selective soldering process is the right one?"

The speaker is Manfred Fehrenbach from EUTECH GmbH. The experience of having evaluated and selected the correct selective soldering process rather than the wrong one often exercises the minds of electronics manufacturers. This is because the number of process variants is large and, ultimately, the final soldering quality in the assembly and connection technology depends on many different parameters. The actual soldering process as well as the layout geometry of the assembly, the pin-pad component geometries and the wetting-friendly metallization of all components involved influence the final soldering result.

The online lecture invites you to understand the essential principles of selective soldering process selection and shows which parameters, conditions and specialties have to be considered in order to achieve an efficient, reproducible and perfectly matched soldering process to the end product.

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EIPC SPEeDNEWS

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NEWS FROM GERMANY

SCHWEIZER CONFERENCE CALL FOR ANALYSTS & INVESTORS

On Friday, November 6, 2020 Schweizer Electronic AG (ISIN DE0005156236) will publish its interim report for the 3rd Quarter 2020. Accordingly, the Managing Board cordially invites you to participate its Conference Call at 10:00 CEST on November 6, 2020.

Conference Call Access Information:

Join Zoom-Meeting

<https://us02web.zoom.us/j/89217368423?pwd=YnUzcklqSmkzeUdVTGVudDZsTUhFQT09>

Meeting-ID: 892 1736 8423

Password: 583662

Quick dial-up mobil

+496938079883,,89217368423#,,0#,,583662# Germany

Dial-up in-country number

+49 69 3807 9883 Deutschland

Meeting-ID: 892 1736 8423

Password: 583662

Questions can be asked by phone with the key combination *9. You will be activated by the moderator. Additionally, you have to unmute yourself by pressing *6.

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EIPC SPEeDNEWS

*The Weekly On-Line Newsletter from the European Institute of Printed Circuits.
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NEWS FROM JAPAN

Japan aims for zero emissions, carbon neutral society by 2050 - PM

By Elaine Lies -Reuters

Japan is aiming to cut greenhouse gases to zero by 2050 and become a carbon-neutral society, Prime Minister Yoshihide Suga said as he unveiled a major shift in position on climate change. Japan had previously said it would be carbon neutral as soon as possible in the second half of the century, rather than set an explicit date.

“Responding to climate change is no longer a constraint on economic growth,” Suga said in his first policy address to parliament since taking office last month.

“We need to change our thinking to the view that taking assertive measures against climate change will lead to changes in industrial structure and the economy that will bring about great growth.”

Japan’s target of no greenhouse gases emissions on a net basis by 2050 brings it into line with the European Union, which set a target of being carbon neutral by that same date last year. Chinese President Xi Jinping in September pledged to make his country “carbon neutral” by 2060.

Japan is the world’s fifth-biggest emitter of carbon dioxide, and while steps are being taken to increase renewable energy, it also plans to roll out new coal-burning power stations.

Later, Industry Minister Hiroshi Kajiyama told a news conference that plans for attaining key parts of the goal would be drawn up by the end of the year.

“Carbon neutrality itself is a growth strategy, and we must carry it out with all we have,” he added.

To achieve its goals, Suga said new solar cells and carbon recycling would be key, and Japan would intensify research and development in those areas, along with digitalising society - a policy he has pushed since taking over from Shinzo Abe.

The announcement was cheered by policy makers and investors.

“Japan joining the EU in targeting carbon neutrality by 2050 is very welcome, and so is PM Suga’s focus on green technologies and especially solar, as a growth driver,” said Eric Pedersen, Nordea Asset Management’s head of responsible investment. But he also warned that Japan would need to start decommissioning coal power and stop building and financing new coal power abroad.

In a nod to Japan’s deep economic ties with giant neighbour China, Suga said a stable bilateral relationship was essential - but also said that Japan would maintain contact with “all like-minded nations for a free and open Indo-Pacific”.

Suga last week made his first visit to Vietnam and Indonesia, part of Japan’s efforts to strengthen ties with Southeast Asian countries as a counter to China’s growing push to assert claims over disputed East China Sea isles.

Suga initially was buoyed by strong support, but a poll conducted by the Nikkei and TV Tokyo at the weekend said his approval had fallen by 11 points to 63% since a poll after he took office a month ago. Disapproval rose by 9 points to 26%, partly due to limited easing of international travel restrictions along with his rejection of six scholars for membership in a science advisory panel, raising concern about academic freedom, the Nikkei said.



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NEWS FROM THE UK



Reminder - 2 Weeks to Book Your Place at:

IMAPS-UK "Making Sense of Sensors" Online Conference

Thursday 12 November 2020: 10:00 - 14:30 UK

- **Assembly Processes** – vacuum, hermetic and non-hermetic packaging of MEMS and MOEMS devices
- **Sensor Types** – imaging, flow, pressure, LIDAR and tactile sensors
- **Graphene** – sensors applied in structural performance monitoring
- **3D Printing** – how 3D printing technologies are making an impact in sensor manufacturing

Organisations presenting include:

University of Cambridge, BESI, Custom Interconnect, Microchip, University College London, Flusso, Teledyne/E2V and DZP Technologies.

Free for IMAPS Members *

£50 (exc VAT) for Non-Members of IMAPS **

* Free to Attend for the following categories of IMAPS-UK Members (Individual, Corporate, Academic, Student) and Members of IMAPS Worldwide.

**Non-Members of IMAPS (including those only registered on IMAPS-UK website)

[Register Here](#)

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The European Institute for the PCB Community

EIPCSPeDNEWS

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ELECTRONICS INDUSTRY NEWS

The Market for Quantum Technology: Early Revenue-Generating Applications

By Lawrence Gasman, Inside Quantum Technology 10.26.2020 1

Quantum technology comprises quantum computing, quantum cryptography, quantum networking (the Quantum Internet) and quantum sensors. All of these sectors of quantum technology are already generating revenues today. Apart from quantum sensors, all are interrelated in important ways, with the prospect of commercial quantum *computing* driving much of the investment in the emerging quantum technology market. Quantum sensors use the sensitivity of quantum devices to increase the effectiveness of medical imaging, global positioning and other applications. They are real and with us today, but I won't have much to say about them in this article

Quantum Computing: State of Play

As recently as two years ago articles were appearing from serious critics saying that quantum computers weren't buildable in practice. Today, much of that skepticism has dissipated; tier-one firms are investing in quantum computing.

[Quantum computers](#) or their components/access networks have already been developed by Alibaba, Amazon, IBM, Microsoft, Google, Honeywell, and Intel. Also playing in this market are well-funded newer companies such as Rigetti, ionQ and D-Wave.

The involvement of household names like IBM, Google or Amazon not only adds credibility to quantum computing but also spreads its fame. With such firms involved in this market, it is easy to get quantum computers onto the home pages of news outlets that ordinarily don't cover advanced physics or supercomputing.

How quantum computers work and the applications they can solve:

This seems like a good place to attempt an explanation of how a quantum computer works. A full explanation is well beyond the scope of this article, but suffice it to say that quantum computers perform calculations based on the probability of an object's quantum state before it is measured. This is compared to what a classical computer does — calculated on the basis of deterministic 1s or 0s.



At the practical level, this translates into quantum computers being able to process orders of magnitude more information than classical computers can in the same period of time. So quantum computers embody a promise that quantum computers can solve problems that classical problems cannot solve in a reasonable time period.

Although quantum computers are already in use, there is some agreement that there are, as yet, no practical problems that can be solved by a quantum computer that cannot be solved by a classical computer. This is a very controversial issue – but this so-called quantum advantage has supposedly been demonstrated for classes of theoretical problems. The areas where quantum computers have been found to be especially useful to date have been in optimization programs, artificial intelligence, and machine learning, and in simulation.

None of this is intended to imply that progress in [quantum computing technology](#) will be easy. While the capacity of quantum computers is measured in qubits (not bits like classical computers), the quality of the qubits is also important. It is difficult to maintain the quantum states of qubits as they are prone to quantum decoherence. Quantum computers require significant error correction since they are more prone to errors than classical computers.

Some of the firms mentioned above are making quantum hardware and selling them to end-users. Some are selling access to their computers over a dedicated cloud, making the otherwise enormously expensive quantum computers (\$10 million - \$15 million) accessible to thousands of users. There is also a slew of companies (including Intel) that are developing processors for future quantum computers.

Banks, Investment and Quanta

Probably the biggest markets for quantum computers in the past few years have been R&D and government (including the military and the intelligence community). This is typical of new computing products. But in the view of Inside Quantum Technology, the market where we think quantum computing will first find big commercial success (the “killer app” for quantum computing?) is in the financial services sector (banks, insurance companies, investment firms, etc.)

We are particularly bullish about this sector for several reasons. First, in the largest banks, quantum computing is already fairly well established. What we are seeing there is the actual usage of quantum computers right now not just trials. Some major banks are even hiring quantum computing experts to help deploy quantum technology throughout their organizations — JP Morgan and Goldman Sachs are examples. Also making financial services a high potential market is there are a lot of large banks and other financial services businesses that could use the power of a quantum computing.

This is not true of all banks, of course, we have heard many medium-size banks say about quantum computing that its fascinating but more than they needed right now, but this might change over the next five years or so.

Pharma: a profitable use for quantum computers

Another area where we see high potential for quantum computers right now is in the specialty chemical and pharma industries. These two areas are similar in that they are both trying to create complex materials. Quantum computers let the chemical and pharma companies bring products to market quicker through simulations and optimizations.

The importance of time to market in the pharma business hardly needs to be explained in this era of COVID-19. Examples of how this sector of the quantum computer market is evolving was the recent investment of BASF Ventures in Zapata Computing. Meanwhile, most of the largest firms in the pharma industry (Roche, for example) have started to trial how quantum computers can help them in their drug discovery procedures.

An application to be feared: QKD and the quantum Internet

More efficient banks, pharmaceutical companies would be considered by most people to be a good thing. However, one type of application that quantum computers appear to promise is to be feared; the ability to break popular key encryption (PKE) techniques. Although quantum computers won't be a threat for quite some time. However, long-lasting information – medical records and plans for aircraft – need protection now because they can be stolen now and decoded when a sufficiently powerful quantum computers become available.

As a result of all this, the encryption community is hard at work producing so-called Post-Quantum Cryptography (PQC) algorithms, which are currently being standardized by NIST. PQC algorithms are intended to be less vulnerable than conventional public-key encryption (PKE) algorithms to being broken by quantum computers. Another way to protect the information in the quantum era is to send it over a quantum network that carries qubits, not bits. This can happen through the use of the quantum key distribution, which encodes the keys in PKE as qubits. When a hacker tries to steal the key, the information the hacker is trying to grab dissolves into a state of incoherence.

The much-fabled Quantum Internet as currently being conceived is first and foremost a quantum key encryption network to be developed in stages with various novel quantum encryption features.

— *Lawrence Gasman is president of Inside Quantum Technology*



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NEWS FROM THE IPC

North American PCB Industry Sales up 7 Percent in September

IPC Releases PCB Industry Results for September 2020

BANNOCKBURN, Ill., USA, October 29, 2020 — [IPC](#) announced today the September 2020 findings from its North American Printed Circuit Board (PCB) Statistical Program. The book-to-bill ratio stands at 0.93.

Total North American PCB shipments in September 2020 were up 7 percent compared to the same month last year. Compared to the preceding month, September shipments grew 21.3 percent.

PCB bookings in September grew 17.2 percent year-over-year and increased 59.1 percent from the previous month.

“Monthly PCB orders and shipments were up sharply in September, near their respective highs for the year. Some of the gains in September were likely the result of month-to-month variations that naturally exist in the PCB market,” said Shawn DuBravac, IPC’s chief economist. “Orders and shipments continue to cool following a large jump in the immediate aftermath of the pandemic. Shipments over the last three months are just below the prior three months, while bookings are off 16.7 percent.”

Detailed Data Available

Companies that participate in IPC’s North American PCB Statistical Program have access to detailed findings on rigid PCB and flexible circuit sales and orders, including separate rigid and flex book-to-bill ratios, growth trends by product types and company size tiers, demand for prototypes, sales growth to military and medical markets, and other timely data.

Interpreting the Data

The book-to-bill ratios are calculated by dividing the value of orders booked over the past three months by the value of sales billed during the same period from companies in IPC’s survey sample. A ratio of more than 1.00 suggests that current demand is ahead of supply, which is a positive indicator for sales growth over the next three to twelve months. A ratio of less than 1.00 indicates the reverse.

Year-on-year and year-to-date growth rates provide the most meaningful view of industry growth. Month-to-month comparisons should be made with caution as they reflect seasonal effects and short-term volatility. Because bookings tend to be more volatile than shipments, changes in the book-to-bill ratios from month to month might not be significant unless a trend of more than three consecutive months is apparent. It is also important to consider changes in both bookings and shipments to understand what is driving changes in the book-to-bill ratio.

IPC's monthly PCB industry statistics are based on data provided by a representative sample of both rigid PCB and flexible circuit manufacturers selling in the USA and Canada. IPC publishes the PCB book-to-bill ratio by the end of each month.



The European Institute for the PCB Community

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International Diary

2020

Electronica 2020 VIRTUAL

10-13 November
München, Germany

EIPC Technical Snapshot Webinar

Registrations via www.eipc.org
18 November

KPCA

24-26 November
Incheon, Korea

ECWC15, WECC World Electronics Circuits Council

Webinar
30 November-2 December

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