



The European Institute for the PCB Community

## EIPC SPEeDNEWS

*The Weekly On-Line Newsletter from the European Institute of Printed Circuits.  
Issue 16- May 2021*

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### NEWS FROM THE EIPC

**EIPC TECHNICAL WEBINAR – WEDNESDAY 19<sup>TH</sup> MAY 2021, 15:00 CET**

#### **FOUR IS BETTER THAN THREE**

Those who write scripts for crime dramas are devoted to TLA's (Three Letter Acronyms) and so the viewers are bombarded with OCG's, DSO's, SOCO's, RTA's, etc etc. We prefer the FLA (Four Letter Acronym) which is an improvement on some of our own industry TLA's such as PTH, PCB, MLB, and one excellent example SAGE – soft and green electronics. Never heard of this? Ah well, if you register now for the next EIPC TECHNICAL SNAPSHOT WEBINAR then you will find out all about it.

We will have four speakers:- from Nano Dimension, Chris Garden will look at the Current Applications and Outlook of AME Additively Manufactured Electronics aka. 3D Printed Electronics, from SUSS MicroTec, Luca Gautero will help you find the right partner for Inkjet Deposition of Solder Mask for PCB Production, and Matti Mäntysalo from Tampere University will show how Printed Electronics enables a novel form factor – soft and stretchable electronics. Finally it will be down to Dr.ir. Ashok Sridhar from the TNO Holst Centre to introduce printed electronics for the next generation of automotive interiors.

Each speaker will speak for 15 minutes and we will end again with a Q&A.

So employ your sagacity and contact Kirsten to ensure a place for you on the 19<sup>th</sup> May. Online registration [www.eipc.org](http://www.eipc.org)

#### **Abstracts:**

**'Printed Electronics enables novel form factor – soft and stretchable electronics'**  
**Author: Matti Mäntysalo; Professor of Electronics with Tampere University.**

Chronic diseases require continuing medical care and limits the daily activities of patients. Digital health solutions, such as wearable electronics, enable transition from discrete monitoring to continuous monitoring. However, current body-worn

sensors and wearable electronic devices are based on miniaturized form of conventional rigid electronics, which leads to bulky and uncomfortable devices and will prevent the further adoption of the technology. The circuit board of the system defines the size, shape, and form factor of the unit, leading typically to bulky and clumsy wearable systems. Unlike traditional electronics, printed intelligence enables fabrication of devices that are thin, flexible, and stretchable. This presentation will focus on fabrication of printed soft and stretchable electronics.

#### **'Printed Electronics for next-gen automotive interiors'**

**Author: Dr.ir. Ashok Sridhar, Senior Business Development Manager & Start-up Specialist, TNO Holst Centre**

Printed Electronics technologies are enabling a wide range of applications across multiple domains, such as personalized healthcare devices, in-mold structural electronics, and even microLED displays.

In the first part of this presentation, an overview of essential building blocks of printed electronics, both current and emerging, will be provided. The second part will focus on how printed electronics is enabling next-generation automotive interiors. Concrete examples of printed electronics-enabled human-machine interfaces and sensing systems will be discussed.

#### **'Current Applications and Outlook of AME Additively Manufactured aka. 3D printed Electronics'**

**Author: Chris Garden, Nano Dimension, Israel**

By 2029 the market for Additively Manufactured Electronics (AME) aka 3D printed electronics is estimated to be worth \$2.3-3.9bn. "The market for professional PCB prototyping is currently growing very rapidly, almost entirely due to market leader Nano Dimension, and has already overtaken the consumer and education." [HARROP 2019]. The paper discusses current applications and outlook for the new production technology with focus on Nano Dimensions AME Technology. Nano Dimension (Nasdaq: NNDM) is a provider of intelligent machines for the fabrication of Additively Manufactured Electronics.

#### **'The Right Partner for Inkjet Deposition of Solder Mask for PCB Production'**

**Author: Luca Gautero**

SUSS MicroTec is an experienced equipment supplier that enters now the PCB manufacturing world with an additive solder mask deposition. Inkjet printing is presented as a solution to issues of traditional technology. The suitability of the SUSS JETx-M Solder Mask comes from attentive functional design which starts from PCB manufacturing goals. Multiple years of production at PCB manufacturing site show the maturity and acceptance. A description of the process and the timing involved provides a good understanding of an overall cost of ownership. The SUSS JETx-M Solder Mask supports the market to step into the additive manufacture



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### NEWS FROM THE UK



### **Professional Development Course: 20 - 25 May 2021**

#### *Wafer and Package Dicing Technology for the Electronics Industry Last Chance to Book*

An Opportunity for In-Depth Online Training, presented by Andy Longford of PandA Europe.

Sawing is the first and most critical step in the die processing operation. There are many variables involved in sawing process such as wafer thickness, the width of the saw streets, the metal composition of the wafer, and the die size.

The objective of this course is to introduce engineers and technicians to the basic principles and options of the various dicing methods and its functions. This course will expose the participants to the various dicing technology such as blade dicing, laser dicing and stealth dicing for both wafer and package technology. In this 4 half-day online webinar, the issues and problem solving for the various defect types and causes will be addressed.

Registration for Professional Development Course on Dicing Technology is open below.  
IMAPS-UK and IMAPS Worldwide Member: £450 exc VAT  
IMAPS-UK Student (Postgraduate and Undergraduate): £300 exc VAT  
Non-Member: £650 exc VAT

[Register Here](#)

For Any other details or information Please contact:

IMAPS-UK Secretariat

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Tel: +44 0131 2029004

e-mail: [Office@imaps.org.uk](mailto:Office@imaps.org.uk)

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### NEWS FROM THE SEMICONDUCTOR INDUSTRY

#### **IBM Unveils World's First 2 nm Chip**

IBM has unveiled the world's first 2 nm chip, built at its R&D facility in Albany, New York. The test chip features gate-all-around transistors built with IBM's nanosheet technology. Overall, IBM says the new process technology will enable 2 nm chips to achieve 45% higher performance or 75% lower power consumption than state-of-the-art 7 nm chips in production today.

IBM was also first to demonstrate 7 nm and 5 nm test chips. The test chip IBM showed today features about 50 billion transistors and uses nanosheet structures as part of a gate-all-around (GAA) transistor, the new transistor architecture heralded as the solution to the scaling limitations of its predecessor, the FinFET.

#### **Infineon Signs Two-Year Deal to Secure SiC Wafer Supply**

Infineon Technologies has concluded a supply contract with the Japanese wafer manufacturer Showa Denko K.K. for an extensive range of silicon carbide material (SiC) including epitaxy. The deal is part of a multi-sourcing strategy for Infineon to secure more base material to address a growing demand for SiC-based products. The contract between Infineon and Showa Denko has a two-year term with an extension option.

SiC enables highly efficient and robust power semiconductors that are particularly useful for photovoltaic, industrial power supply, and charging infrastructure for electric vehicles. "Our broad and fast growing portfolio demonstrates Infineon's leading role in supporting and shaping the market for SiC-based semiconductors which is expected to grow 30 to 40% annually [according to analyst firm Yole Développement] over the next five years," said Peter Wawer, president of the industrial power control division at Infineon

#### **Vodafone Opens Lab to Smooth Open RAN Adoption**

Vodafone has made good on its promise of late last year that it would establish Test and Integration Laboratories across Europe to promote deployment of the disruptive open radio access network (RAN) technology. The initial facility will be based at Newbury, the group's UK headquarters and technology hub, and when fully staffed is expected to employ about 30 engineers. It will work with a wide range of potential but yet unidentified partners and suppliers to ensure seamless interoperability. The Newbury centre will be the first of several in Europe scheduled to focus on Open RAN issues ahead of the company deploying the

technology. The operator is one of the keenest within Europe to accelerate the use of Open RAN. Earlier this year, it signed up to a joint effort with Deutsche Telekom, Orange and Telefonica to advance that ambition.

### **Facial Recognition on the rise to verify payments**

Let's face it, facial recognition is on the rise as a biometric identification technique for verifying mobile payments, driven by applications like Apple's FaceID implementation. But those who track the payment authentication sector say facial recognition will continue to lag current biometric techniques like fingerprint sensors until more robust hardware implementations hit the market. The inflection point appears to be 2025, according to Jupiter Research, which forecasts software-based facial recognition technology will by then exceed 1.4 billion users. If accurate, that prediction represents a 120 percent increase over five years

### **Foundry Expansion, Wafer Shipments Reflect Global Chip Boom**

While global semiconductor manufacturers are stingy with details about fab expansion and capacity utilization, forecasters are nevertheless predicting steady growth in installed "front-end" capacity driven largely by resurgence in demand for memory. Asian chip makers benefitting from generous government incentives remain the biggest spenders on new foundry capacity, according to the industry group SEMI. Meanwhile, Intel Corp. and other western IC manufacturers are hustling to catch up with Taiwan Semiconductor Manufacturing Co. (TSMC), Samsung and a host of Chinese upstarts. For instance, as part of Intel's \$20 billion foundry expansion plan, the chip maker just announced a \$3.5 billion expansion at its Rio Rancho, N.M., facility. Intel said this week the investment would expand its advanced IC packaging operations, particularly its Foveros 3D packaging technology

### **DRAM Destined to be 3D**

It may take a few years, but DRAM is likely to follow the footsteps of NAND and go 3D, which means it will need new manufacturing equipment and materials to do it cost-effectively. Applied Materials' latest materials engineering solutions are all about supporting DRAM scaling in the near term and positioning customers for the longer term. Aimed at accelerating improvements in chip performance, power, area, cost, and time to market, the company's new offerings target three areas of DRAM chips: storage capacitors, interconnect wiring, and logic transistors.

Applied Materials' Draco is a new hard mask material that has been co-optimized to work with the company's Sym3 Y etch system in a process monitored by its PROvision eBeam metrology and inspection system. It can take nearly half a million measurements per hour, said Sony Varghese, director of strategic marketing for the company's memory, semiconductor products group. This new material increases etch selectivity by more than 30%, which enables a shorter mask. The combination of Draco and the Sym3 Y etch system uses advanced RF pulsing to synchronize etching with by-product removal to enable patterning holes that are perfectly cylindrical, straight, and uniform, he said.

## World Economic Round Up

A year ago, as the pandemic ravaged country after country and economies shuddered, consumers were the ones panic-buying. Today, on the rebound, it's companies furiously stocking up. Mattress producers to car manufacturers to aluminium foil makers are buying more material than they need to survive the breakneck speed at which demand for goods is recovering and assuage that primal fear of running out. The corporate buying and hoarding is pushing supply chains to the brink of seizing up. Shortages, transportation bottlenecks and price spikes are nearing the highest levels in recent memory, raising concern that a supercharged global economy will stoke inflation.

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### ELECTRONIC INDUSTRY NEWS

#### **Foxconn launches mass hiring drive in China as output in India sinks**



Workers are seen at a workshop in Longhua science and technology park of Foxconn Technology Group in Shenzhen, south China's Guangdong Province, Feb 22, 2019. (Xinhua/Mao Siqian)

Foxconn is expanding its recruitment at several plants in China and offering higher bonuses for candidates and middlemen, which experts say could be groundwork for moving some production to China from India, where output has been severely affected by the seemingly uncontrollable COVID-19 outbreak in the South Asian country.

Factories in Taiyuan, North China's Shanxi Province and Zhengzhou, Central China's Henan Province are offering a one-time bonus from 5,000 (\$777) up to 7,000 yuan for those who work up to at least 90 days, two sources with the human resources division of Foxconn told the Global Times on Wednesday. For those who work longer will get more bonus in return.

"Several sections are looking for more workers to make products including iPhones, and we're recruiting as many people as possible these days," said one of the sources. Another recruitment manager said that the factory in Shenzhen alone needs another 20,000 workers.

Both sources spoke to the Global Times on the condition of anonymity.

Foxconn recruits year-round because of high turnover, but this recent move is still unusual given the timing. The Apple contract factory in India has been disrupted, with output of products like the iPhone 12 slumping more than 50 percent after workers infected with COVID-19 had to leave their posts, Reuters reported.

It remains unclear whether there is a direct connection between the mass recruitment in China and the disruptions in India, but several industry insiders told the Global Times on Wednesday that it's highly likely Foxconn will seek to diversify some of its operations amid the epidemic.

"If the Foxconn plant in India does not resume production for a long period

of time and there is demand for phones to be sold in India, it is possible for them to shift production to China," Ma Jihua, an industry insider, told the Global Times on Wednesday.

Such a shift would be a set-back for companies that are reportedly shifting production out of the Chinese mainland, a plan that evidently face profound risks and challenges. It would also deal a major blow to India's ambitious plan to bolster its manufacturing capability as it faces a raging epidemic.

Earlier this month, market research firm Counterpoint suggested that Apple had been slowly and smoothly shifting production out of the Chinese mainland, its second-largest market, but the epidemic disrupted that attempt and Apple's 2020 production in the Chinese mainland returned to 2017 levels.

Yang Shucheng, secretary-general of the India China-Mobile-Phone Enterprise Association, said that the possibility of a supply chain transformation could not be ruled out, should the epidemic remain out of control.

Chinese mobile brands such as OPPO and VIVO have already transferred some of their orders from India to factories in China after the epidemic in India posed increasing problems like local labor shortages and logistics halts at some ports, Yang told the Global Times on Wednesday, noting that

Apple could also increase its domestic orders.

However, Yang noted that the transformation can't take place on short notice, because the materials of Foxconn's Indian factories are all in India, and Apple's phone sales are declining, so it may take at least three months - if it actually happens.

It is hard to predict when the epidemic in India can be reined in, which means uncertainty for the labor-intensive industry in which companies like Foxconn are deeply involved, Liang Zhenpeng, another industry analyst, told the Global Times on Wednesday.

"To many contract factories, it is possible to look at other alternatives and China, where the epidemic is well controlled and the supply chain is adequate, can guarantee smooth production," said Liang.

## **Gartner Survey Reveals Most CEOs Anticipate an Economic Boom Rather Than Stagnation Over the Next Two Years**

Over a Quarter of CEOs Anticipate Returning to or Exceeding 2019 Revenue Levels in 2021

More CEOs anticipate an economic boom (60%) than stagnation (40%) in 2021 and 2022, according to a recent survey of CEOs and senior executives by Gartner, Inc. Most respondents (35%) anticipate returning to or exceeding 2019 revenue levels as early as this year.

“CEOs’ top priorities for 2021 show confidence,” said Mark Raskino, distinguished research vice president at Gartner. “Over half report growth as their primary focus and see opportunity on the other side of the crisis, followed by technology change and corporate action.

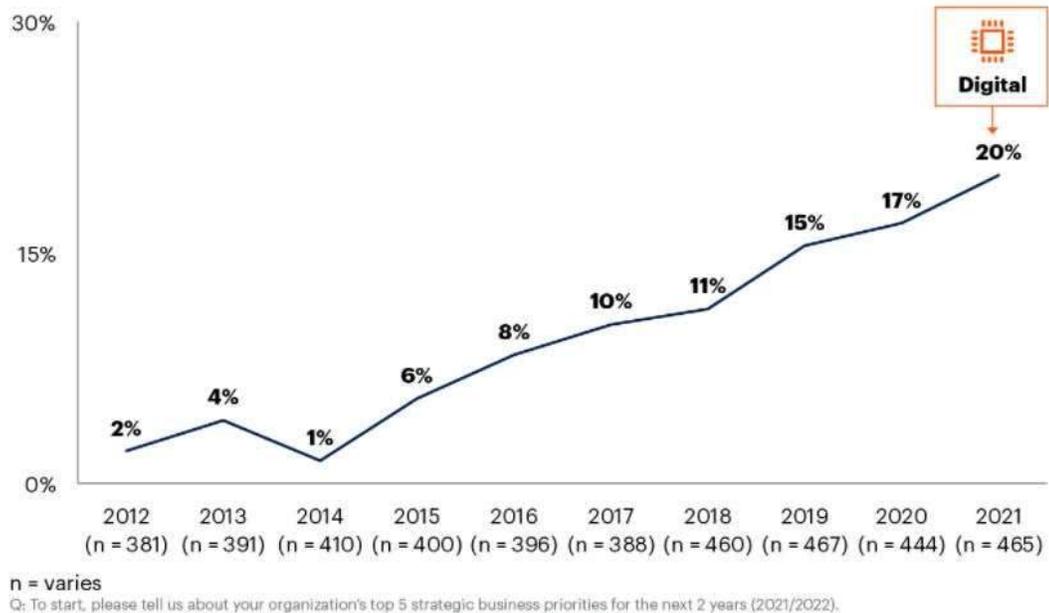
“This year, all leaders will be working hard to decode what the post-pandemic world looks like and redeveloping mid- to long-range business strategy accordingly. In most cases, that will uncover a round of new structural changes to capability, location, products and business models.”

The annual Gartner 2021 CEO Survey was conducted between July 2020 to December 2020 among 465 actively employed CEOs and other senior business executives in North America, EMEA and APAC across different industries, revenue and company sizes.

### **CEOs Prioritize “Digital”**

Technology-related change was the second-highest priority for CEOs. When asked about their organization’s top five strategic business priorities for the next two years, respondents gave answers in their own words. CEOs’ responses increasingly included the simple word “digital,” cited by one in five CEOs in this year’s survey (see Figure 1). Digital capabilities were also the only category in which CEOs intended to increase [investment](#) in 2021.

*Figure 1: Unprompted Use of the Word “Digital” When CEOs State their Top Business Priorities*



Source: Gartner (May 2021)

When it comes to specific technologies, CEOs see [artificial intelligence \(AI\)](#) as the most industry-impactful technology. Over 30% of respondents said that quantum computing will be highly relevant to their long-range business plans but are still not quite sure how. Blockchain, [5G](#), AI and quantum computing are at the forefront of an emerging economic race between the U.S. and China, with one-third of CEOs believing that evolving trade disputes between the two nations over these technologies are a significant concern for their businesses.

### **Expect a Wave of Mergers and Acquisitions (M&A)**

Within CEOs' third strategic business priority of "corporate action," M&As were the most mentioned item, rising 75% year-over-year. This shows that CEOs and senior executives seeking advantage from a cyclical downturn are going shopping for structural inorganic growth.

There was a significant reduction in mentions of "sales revenue" within the growth priority category and a significant increase in mentions of "new markets" across different industries and company sizes, suggesting that CEOs are finding it hard to obtain simple incremental sales revenue growth using the strategies that have served them well in the past.

"Techquisitions can bolster digital business progress, while also providing access to potential fast-growth market sectors," said Mr. Raskino.

### **CEOs Acknowledge Societal Impacts on Business**

Over 80% of CEOs expect enduring societal behaviour change arising from the pandemic, such as a permanent shift to hybrid work. Shifts in customer behaviour are expected as well: The biggest concern among CEOs is that customer demand will be constrained, particularly in industries such as travel, and that consumers and chief financial officers (CFOs) alike will hold back on related expenditures.

“More use of digital technology and the demand for digital channel flexibility are also within the top three anticipated shifts in customer behaviour. This suggests that continuing to improve the way customers are served digitally will be vital,” said [Kristin Moyer](#), distinguished research vice president at Gartner.

As key matters of sustainability and social justice rise to the foreground of public consciousness in many countries, 39% of CEOs said that taking an active social justice stance is good for business and that their employees are mostly of one mind. This leaves 61% who are tentative around such subjects – the majority are still not confident and comfortable navigating the business through this area of change. In addition, nearly half of CEOs (45%) said climate change mitigation is having a significant impact on their businesses.

Gartner clients can read more in the report [“2021 Gartner CEO Survey: The Year of Rebuilding.”](#) Learn more about CEO priorities in the complimentary Gartner webinar [“Gartner CEO Survey 2021: The Shift in Business Leader Priorities,”](#) taking place May 11, 2021 at 10AM EDT.

Learn how to turn effective decision making into a competitive advantage in the free Gartner e-book [“The Future of Decisions.”](#)

#### **About the Gartner Information Technology Practice**

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## **Ransomware Shuts Down Pipeline, Affecting 17 States**

By [Ann R. Thryft](#) 05.11.2021 1

Here we go again. This time, it’s an oil pipeline. This time, it’s ransomware.

Security researchers, cybersecurity providers and various parts of the U.S. government keep telling us over and over, ad nauseum, that attacks on critical infrastructure are not going away. They just keep growing, as we reported barely a week ago.

So the largest U.S. fuel pipeline was forced to shut down operations this past weekend after a ransomware attack. The feds had to declare emergency powers to make sure oil gets sent where it needs to go along 5,500 miles of pipeline running through 17 states.



Carl Herberger

The regional emergency declared Sunday by the federal Department of Transportation relaxes regulations governing the transport of gasoline, diesel and jet fuel. Its goals are to minimize disruptions to local supply throughout Colonial's service region, the eastern U.S., and avoid price hikes.

Colonial Pipeline said on Saturday it was temporarily halting operations, while revealing that its IT systems were affected by ransomware. On Sunday, it said "some smaller lateral lines between terminals and delivery points" had come back online. On Monday, in an updated statement, the company said it will be restoring operations in a phased approach and expects to resume service by the end of this week.

### **Industrial ransomware attacks growing**

Industrial control systems (ICS) in utilities and manufacturing plants — aka critical infrastructure — are increasingly targets for cybersecurity attacks, especially ransomware. We've been hearing this for not only months, but years.

In December 2020, right as the SolarWinds attack was being revealed, security researchers at cybersecurity leader Dragos and IBM reported that ransomware attacks on ICS in utilities and manufacturing plants jumped an incredible 500% in the last two years.

According to a March report from Dragos, ransomware attacks in manufacturing alone tripled last year. The entire industrial sector now accounts for nearly a third of ransomware attacks, more than any other sector, and attacks on ICS are increasing in developed countries.

Ransomware attacks on industrial targets have already caused disruptions of various kinds, including usually temporary plant shutdowns. Last month, it was an unnamed European manufacturer which had to shut down two production plants. In January, packaging leader WestRock said a ransomware attack had affected both operational technology (OT) and IT systems, impacting production for a few days.

Barely a couple of weeks ago, the NSA advised owners of OT systems to, basically, disconnect them from internet-connected IT systems whenever possible, because connecting all those critical control systems just makes them vulnerable to malicious attacks. Which is true, of course. Failing that, the NSA would really appreciate it if critical infrastructure owners would at least evaluate how the risks of connecting everything stack up against the benefits, and at least use good OT cybersecurity hygiene practices.

### **Solutions must include tighter controls over product development**



What measures can organizations take to help prevent ransomware attacks and cut their risk? The basic drill is well known by now. “The most important are onboarding powerful security tools, and adopting significant practices so you have a more mature organization,” Carl Herberger, vice president of security services for CyberSheath, told *EE Times*.

But leaving everything up to the companies and organizations running critical infrastructure is clearly not enough. Herberger thinks a program like the Department of Defense’s new Cybersecurity Maturity Model Certification (CMMC) program is a good model for OT and ICS devices used in infrastructure, since it details what suppliers have to do to maintain healthy security in their products.

“It’s the last in the line of many attempts by the federal government to programmatically ensure security in the products it buys,” he said. “But CMMC only applies to products that are not also being sold in the open market today. It doesn’t give oversight for commercial off-the-shelf providers. So we’ve got two broad holes: first, companies are resistant to do what’s required under CMMC, and second, we’ve got to get COTS providers to become compliant in some similar way.”

It could be more than a possible model. Because the DoD is the largest buyer of IT services in the world, and because anyone selling to them must prove CMMC certification, opening up the program to include COTS providers would be a huge step, said Herberger. “To help defray the costs of the investment to become certified, certain companies may need some kind of cost sharing or offset, such as tax-deductible or tax-deferred status,” he said.

While administration officials reportedly met over the weekend to find out if other critical infrastructure companies might also be vulnerable to the attackers, President Biden has considered cybersecurity a top priority since before he took office.

And only two weeks before the attack on Colonial Pipeline, the Department of Justice formed the new Ransomware and Digital Extortion Task Force to address the it-feels-like-drinking-from-a-firehose ongoing attacks on U.S. critical organizations.

Meanwhile, products continue to be built without security in mind — or at least, without enough of it — and sold to private enterprises managing public infrastructure. This just can't keep going on.

“We’ve now hit the Rubicon: after SolarWinds, the Florida water treatment plant, and now Colonial Pipeline, we’re seeing really serious threats to our national security,” said Herberger. “If everyone was on a program like CMMC and COTS environments were covered by it, we could dramatically reduce risk to OT and ICS systems in our critical infrastructure.”

I think he’s right.

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Ann R. Thryft

*Ann R. Thryft has written about manufacturing- and electronics-related technologies for Design News, Test & Measurement World, EDN, RTC Magazine, COTS Journal, Nikkei Electronics Asia, Computer Design, and Electronic Buyers' News. She's introduced readers to several emerging trends: industrial cybersecurity for operational technology, industrial-strength metals 3D printing, RFID, software-defined radio, early mobile phone architectures, open network server and switch/router architectures, and set-top box system design. At EBN Ann won two independently judged Editorial Excellence awards for Best Technology Feature. Currently, she is the industrial control & automation designline editor at EE Times. She holds a BA in Cultural Anthropology from Stanford University and a Certified Business Communicator certificate from the Business Marketing Association (formerly B/PAA).*

## **Gartner Says Global Chip Shortage Expected to Persist Until Second Quarter of 2022**

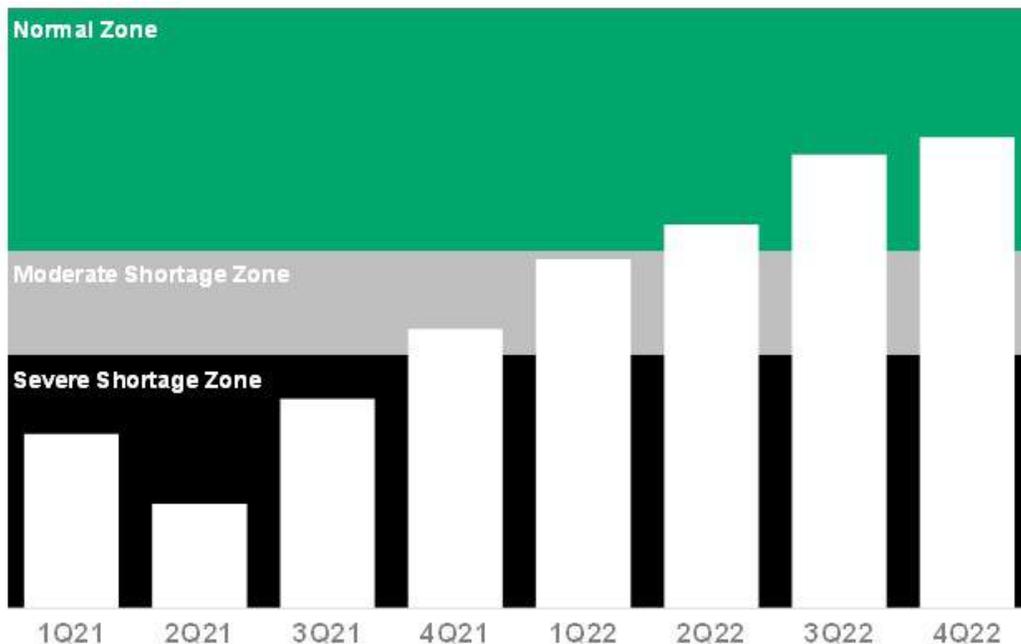
The worldwide semiconductor shortage will persist through 2021, and is expected to recover to normal levels by the second quarter of 2022, according to Gartner, Inc.

“The semiconductor shortage will severely disrupt the supply chain and will constrain the production of many electronic equipment types in 2021. Foundries are increasing wafer prices, and in turn, chip companies are increasing device prices,” said [Kanishka Chauhan](#), principal research analyst at Gartner.

The chip shortage started primarily with devices, such as power management, display devices and microcontrollers, fabricated on legacy nodes at 8-inch foundry fabs, which have a limited supply. The shortage has now extended to other devices, and there are capacity constraints and shortages for substrates, wire bonding, passives, materials, and testing, all of which are parts of the supply chain beyond chip fabs. These are highly commoditized industries with minimal flexibility/capacity to invest aggressively on a short notice.

Across most categories, device shortages are expected to be pushed out until the second quarter of 2022 (see Figure 1), while substrate capacity constraints could potentially extend to fourth quarter of 2022.

Figure 1. Gartner Index of Inventory Semiconductor Supply Chain Tracking - Projected Worldwide Semiconductor Inventory Index Movement, 2021-2022



Note: 1Q21 is a modelled estimate and is subject to change based on actual financials reported by vendors in 2Q21. The index bar for 2Q21 to 4Q22 is only a directional estimate. Source: Gartner (May 2021)

Gartner analysts recommend that OEMs dependent directly or indirectly on semiconductors take four key actions to mitigate risk and revenue loss during the global chip shortage:

- **Extend supply chain visibility** – The chip shortage makes it essential for supply chain leaders to extend the supply chain visibility beyond the supplier to the silicon level, which will be critical in projecting supply constraints and bottlenecks and eventually, projecting when the crisis situation will improve.
- **Guarantee supply with companion model and/or preinvestments** – OEMs with smaller and critical component requirements must look to partner with similar entities and approach chip foundries and/or OSAT players as a combined entity to gain some leverage. Additionally, if scale allows, preinvesting in a commoditized part of the chip supply chain and/or foundries, could guarantee the company a long-term

supply.

- **Track leading indicators** – While no relevant parameter by itself will project how the shortage situation will evolve, a combination of relevant parameters can help guide organizations in the right direction.

“Since the current chip shortage is a dynamic situation, it is essential to understand how it changes on a continuous basis. Tracking leading indicators, such as capital investments, inventory index and semiconductor industry revenue growth projections as an early indicator of inventory situations, can help organizations stay updated on the issue and see how the overall industry is growing,” said [Gaurav Gupta](#), research vice president at Gartner.

- **Diversify supplier base** – Qualifying a different source of chips and/or OSAT partner will require additional work and investment, but it would go a long way in reducing risk. Additionally, creating strategic and tight relationships with distributors, resellers and traders can help with finding the small volume for urgent components.

Gartner clients can learn more in [“Semiconductor Inventory Analysis Worldwide, 1Q21 Update,”](#) [“Expert Insight Video: Global Chip Shortage Impacting the Automotive Sector,”](#) and [“Quick Answer: What Supply Chains at OEMs Dependent on Semiconductors Must Do in Wake of Current Chip Shortages.”](#)

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## International Diary

### 2021

#### **8<sup>th</sup> EIPC Technical Snapshot Webinar**

Registrations via [www.eipc.org](http://www.eipc.org)

May 19

#### **9<sup>th</sup> EIPC Technical Snapshot Webinar**

Registrations via [www.eipc.org](http://www.eipc.org)

June 16