Fastener Industry **Report 2023**

Insights into the challenges, opportunities and innovations in the fastener industry, delivered by PEM® experts.

PEM®

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Introduction

Technology is changing how people work — the engineering/manufacturing sector is no exception.

As our modern world becomes increasingly digital, it's crucial for companies in all industries to invest in learning, adopt new technologies and continue to innovate.

Discover the challenges and opportunities introduced with the latest industry innovations in the following sections.

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Chapter 1

Industry Challenges

Many of the challenges currently facing the industry have been developing over the last few years. No industry has been immune to the impact of the COVID-19 pandemic, and the complications it brought for the manufacturing and engineering sector continue to hold some weight today.

The fastener industry's primary challenge in 2023 continues to be centred around the supply chain.

Supply Chain Issues

The fastener industry has been suffering significant supply chain issues for the last few years. Previously, these issues were connected to logistics, caused by the global pandemic and exacerbated in Europe when the full impact of Brexit hit.

The political environment of 2023 continues to impact the global supply chain, with the ongoing conflict in Ukraine affecting the availability and cost of raw materials.

As a result, supply chains need to remain agile as industries attempt to overcome continuing complications. Production processes, product availability and lead times are all impacted, and it's crucial for those involved at each stage of the supply chain to remain aware and adaptable in light of these challenges.

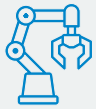
In addition to the challenges posed globally, some of the most common causes of supply chain disruption include:

- Production being unable to keep up with demand
- Buyers purchasing the wrong type of fasteners for their applications
- Low-quality fasteners flooding the market
- Shipping delays and logistical issues

PEM® experts are acutely aware of the complications that can arise when 1% of your build materials become 100% of the problem, which is why we're channelling investment into solutions to mitigate many supply chain issues, such as:

Increased Production Capability

By investing in additional and upgraded production facilities to help us keep up with demand.



Modernised Manufacturing Processes

Making production more efficient to reduce lead times.

Dedicated Field and Technical Support

So our customers can feel confident in their design decisions and receive advice from our technical experts whenever they need it.

Our global footprint enables us to manufacture our products in the regions where they're consumed, mitigating the need for international export and reducing the risk of supply chain challenges. Our manufacturing footprint is also supported by a network of in-house engineering experts at every location.

Personnel Shortages

The fastener industry — and the wider manufacturing industry — is falling victim to a widespread personnel shortage. There are several factors currently driving this.

The pandemic put many production lines on hold. As a result, those working in the manufacturing sector may now have moved on to seek employment elsewhere, resulting in a greater number of people leaving the industry.

In parallel, the bottlenecks created by the pandemic are still being dealt with as companies battle against ongoing supply chain issues. This means there's now increased demand across the board, without enough people with the necessary skills to fill the roles.

From a skills perspective, innovations and technological advancements within the sector — some of which we explore within this report — have led to a sizable knowledge gap among engineers and fabricators. Those in these roles are now required to retrain and upgrade their skills to address new challenges they're unlikely to have anticipated previously.

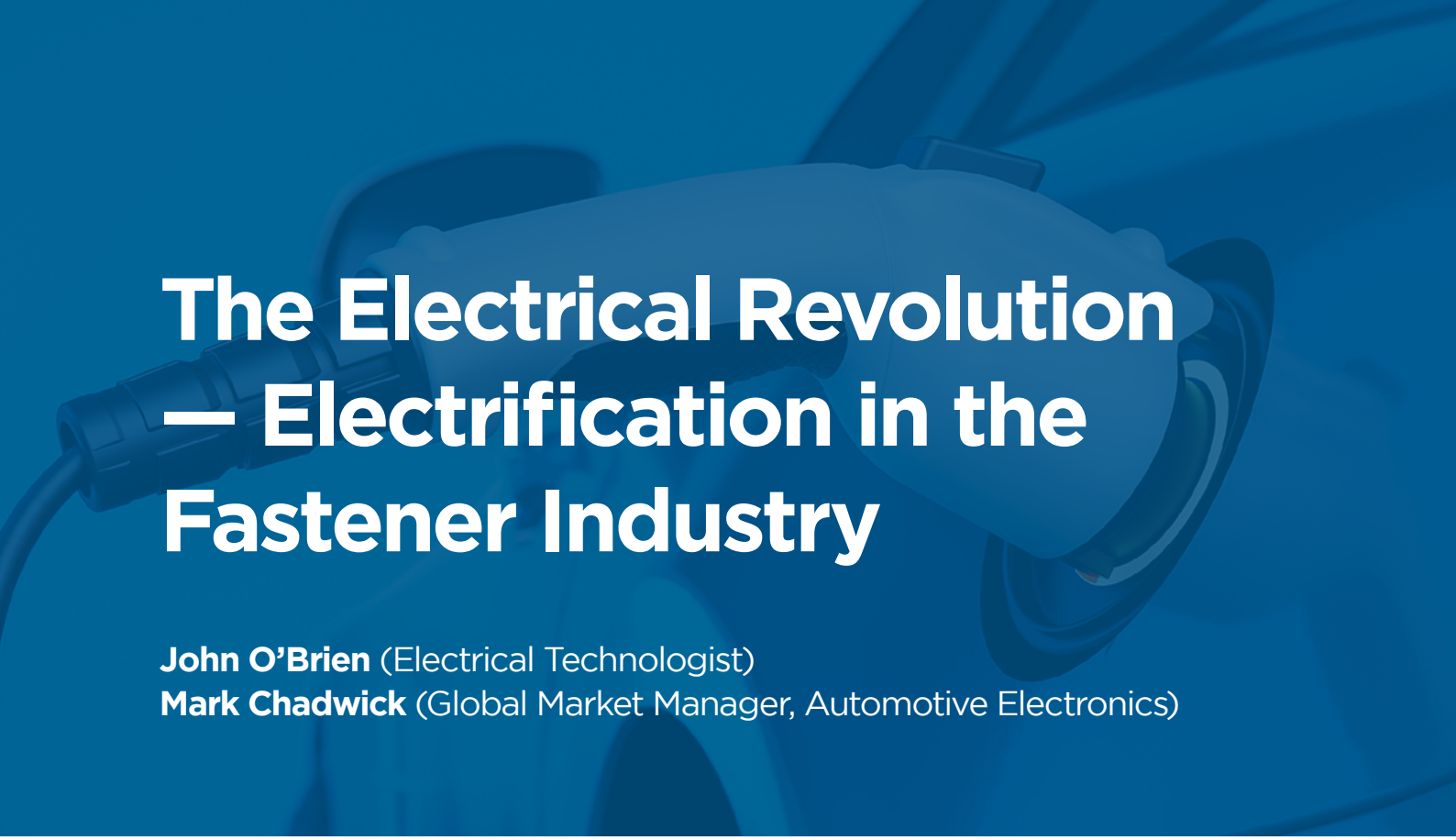
For example, the increasing adoption of electric vehicles has resulted in mechanical engineers now needing knowledge of electrical engineering principles to do their job — something they may never have needed before.

While it's possible to say that technological advancements have contributed to the industry's personnel shortages, technology is also the solution with the potential to make the industry more accessible to the next generation of engineers. By creating a technology-enabled workforce, companies are more likely to attract younger applicants to replace those moving on or retiring.

Chapter 2

Innovations

In this section, we'll explore the latest industry innovations and technologies. Our experts share their insights on where these trends will take us over the next twelve months.



The Electrical Revolution — Electrification in the Fastener Industry

John O'Brien (Electrical Technologist)
Mark Chadwick (Global Market Manager, Automotive Electronics)

One of the biggest trends impacting the fastener industry is electrification — specifically, the large-scale manufacture and use of electric vehicles.

The electrification trend encompasses more than the move from Internal Combustion Engines (ICE) to Electric Vehicles (EV) — it also includes the hybrid movement and the electrification of ICE components. It spans all areas of the automotive industry, with a resulting impact on how design and mechanical engineers work, as well as the work that we do here.

In recent years, there have been two major shifts in the field of automotive electronics:

1. Electrification to replace ICEs

2. 400V systems replaced by 800V systems

"In the change from ICE to electrification, the whole electrical structure of the vehicle has had to be redesigned," says PEM® Global Market Manager in Automotive Electronics, Mark Chadwick. "In recent years, such changes have been slowly implemented as designs have gradually evolved. But with innovations being made more rapidly and on a larger scale, we're now seeing a shift from small evolutions to a complete electrification revolution in the automotive industry.

“The main challenge brought about by this revolution is in upskilling and supporting those involved at the design level. Most of the professionals involved in designing the systems are mechanical engineers — people who, up until now, most likely won’t have had much experience with electrical components and may not be aware of the electrical requirements for these new systems.”

The second major shift in the field has come with 800V systems replacing 400V systems — a move that has created several further challenges but also a good deal of opportunity. The 800V systems currently being used allow for faster charging times and offer a greater range because the vehicles can be made lighter.

“The challenge with this is that the components previously designed for 400V systems are now outdated, but with 800V systems they can be made with smaller cross-sectional areas,” explains Mark. “Whilst in one respect this is a positive, as the vehicles can be lighter and the components take up less space, it also presents a complication in that design engineers are essentially back at square one in the design process.

“In relation to the fastener industry, this is something that hasn’t really happened before. Those with experience of working with fasteners will have a great deal of knowledge about how to design mechanical joints, but this isn’t something that will have necessarily been on their radar.”

“The second challenge posed is keeping these components cool,” says John O’Brien, Electrical Technologist. “For example, copper busbars in static installations will have been designed with a 2 A/mm^2 standard. However, in the EV industry, the 2 A/mm^2 busbar was quickly found to be too large, so this component has been developed and now 10 A/mm^2 busbars are commonly used.

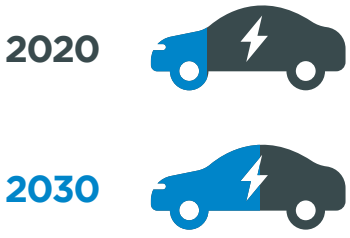
“The impact of this is that a key part of the EV becomes a refrigeration system to keep those components cool. As a result, to get to that lighter EV, engineers really have to push the performance of the components — the busbars, the inductors, the motors, and all of those electric aspects — because they can’t afford to oversize those components.”

Where Is the Automotive Industry Headed?

The future of the automotive industry is headed toward the widescale adoption of electric vehicles. While there are many steps along the way, contrary to popular belief, this shift is not a slow development. We're seeing big changes happening quickly in the industry, particularly in developing hybrid vehicles.

"Generally, no vehicle is completely immune to the electrification movement, even the ICEs," says John. "While ICEs may still exist, there are subcomponents in the car that are being developed to allow for electrification. An example is the heating system — typically, a car would be heated by excess engine heat channelled through a radiator. Now we're seeing a lot more electric radiators with electric fans.

"This shift to electrification is also evident in power steering. Where previously it would have been powered by a hydraulic pump driven by the engine, it's now being replaced by an electric motor that offers power assistance. This is the case in ICEs, hybrid vehicles and EVs."



▲ Vehicle's costs attributed to automotive electronics

"Reports suggest that by 2030, over 50% of a vehicle's cost will be attributed to automotive electronics or electrification, and that's a huge development. In the early 2000s, this figure would have been closer to 20%, so this is a clear marker of the revolution that's taking place in the automotive industry."

As a result of these innovations within the automotive industry and the push to reduce carbon emissions, the prediction is that in a decade or so, drivers will struggle to find a vehicle that doesn't operate with some form of electric hybrid, if not as a full EV. While there's still some degree of uncertainty around the future of larger vehicles, such as buses, trucks, articulated vehicles and aircraft, there's no doubt that passenger vehicles and other small vehicles, such as scooters or motorcycles, will be electric.

The impact on the industry comes with the amount of investment required to see this achieved, as all of the investment made into the development of ICEs over the last century is replaced and reinvested into battery, inverter and motor technology. Alongside this is an investment into the charging network, which requires equal resources.

“These shifts have created a host of new positions in the industry. The challenge is that there aren’t enough people with the required knowledge and experience to fill these positions, so not only is the supply chain changing, but we also need to make room for the dynamic workforce entering it.

“From a fastener industry perspective, the key challenge we now face is educating the mechanical engineers who lack the necessary understanding of the electrical requirements of these EV and hybrid systems — engineers who probably never expected to be working with fasteners at some point in their career. In this respect, engineers in this position might not even be aware of their knowledge gap — they might not know what they don’t know.

“The great thing about our service offering is that we can provide the support, training, education and insights engineers in this sector need, and we can deliver this knowledge practically on demand. Equally, we can highlight potential solutions to their challenges while educating them on what those solutions do — sometimes, fixing problems they’re unaware may crop up. With the FastenerClass™ program, engineers gain a better understanding of how fasteners work while receiving expert guidance on what they should look out for from an electrical contact perspective, and suggestions on fasteners suitable for electrical connectivity.

“These professionals don’t have to be full electrical engineers, but their work may benefit from being guided by an electrical engineer, like the PEM® team of experts.”

The Impacts of Digital Transformation on Fabrication

Pete Beecherl (Chief Technology Officer)

Digital transformation is visible across almost all industries, fabrication and manufacturing included.

Within our industry, digital tools have huge potential to revolutionise our ways of working by making quoting, design and production processes more efficient. Digitisation of certain processes can also mitigate the risks of errors made at the design stage, thereby reducing the risk of quality control issues, scrapped parts or product failures in subsequent stages.

In recent years we've seen considerable developments in the capabilities of digital tools and solutions to:

- Increase speed to quote
- Help with inventory control
- Reduce quality issues and the associated cost
- Generally, make lives easier

With investments already being made into further developing these tools, companies choosing to adopt new technologies will be putting themselves in the best position to create a sustainable future and get ahead of the curve.

“Digitisation opens up a world of opportunities for companies operating in this sector, and the PEM® team is fully behind the use of digital tools at the design stage, the quoting stage and on the manufacturing floor,” says Pete Beecherl, Chief Technology Officer, Global Technology Team.

What is Driving Digital Transformation in the Industry?

“Across the board, there’s a generational change taking place in the industry, in companies of all sizes,” explains Pete. “In many cases, the existing workforce, who have years of expert knowledge stored away in their head, is making way for the newer, less experienced workforce.

“The younger people in the business don’t have it all in their heads yet, and they’ve grown up with digital technology in almost every aspect of their lives, so they’re keen to use digital and self-service tools to speed up that learning process and make their ways of working more efficient. This is one of the key drivers for digital transformation within the industry.

“As a result, and with digital tools being adopted across all industries to improve efficiency, those who don’t leverage these digital innovations are likely to fall behind — both in terms of optimising their productivity and in terms of creating an attractive work environment for the next generation.

“The shortage of manufacturing personnel has been a challenge for the industry for a number of years now, but it’s likely to become a bigger problem as time goes on. We need to find ways to make manufacturing places an inviting environment where young people want to go to work, and embracing digital transformation is one of the ways to achieve this.”

What are the Potential Use Cases for Digital Solutions in Manufacturing?

“Digital solutions are being designed to answer specific challenges faced in the industry,” says Pete. “Currently, the determining factor of whether or not a company will win an opportunity revolves around their ability to provide a quote for the project quickly. After this, the accuracy of their costings determines how much money they can realistically make from the opportunities they win.

“What many companies don’t realise is how costly fastener mistakes can be. While fasteners may not be the biggest portion of the cost involved in making an assembly, from a quality and complexity perspective, fasteners are arguably the most significant part of any given project. There are likely to be multitudes of fasteners needed for an assembly and if even one of them is wrong, the part becomes scrap — and that’s after there’s already been so much value added to it.

“Sometimes, this can happen due to an error made further up the chain. For example, if a design engineer indicates the wrong hole size or has selected the wrong type of fastener for the material.

“We recognise this can be a significant pain point for those in the industry and this is where digital transformation offers a great deal of opportunity. We’ve partnered with a software company and are working on a solution to automate this process, flagging potential errors and mismatched materials before the production process properly begins.

“Not only will this increase the accuracy and speed in quoting and reduce the risk of quality issues further down the line, but it will also enable the generational transition within the industry.”

Where is Digital Transformation Headed?

For PEM® solutions, the future of the industry will offer a seamless integration of human knowledge and experience combined with digital intelligence and foresight, allowing fabricators and design engineers to work with greater speed and accuracy, and produce parts of a higher quality.

“Digitisation in design is something that’s been happening for many years, but there haven’t been any revolutions in the last couple of decades,” says Pete. “Potentially, AI is the next revolution in product design, but the technology generation and associated adaptation timing is unclear at this point.

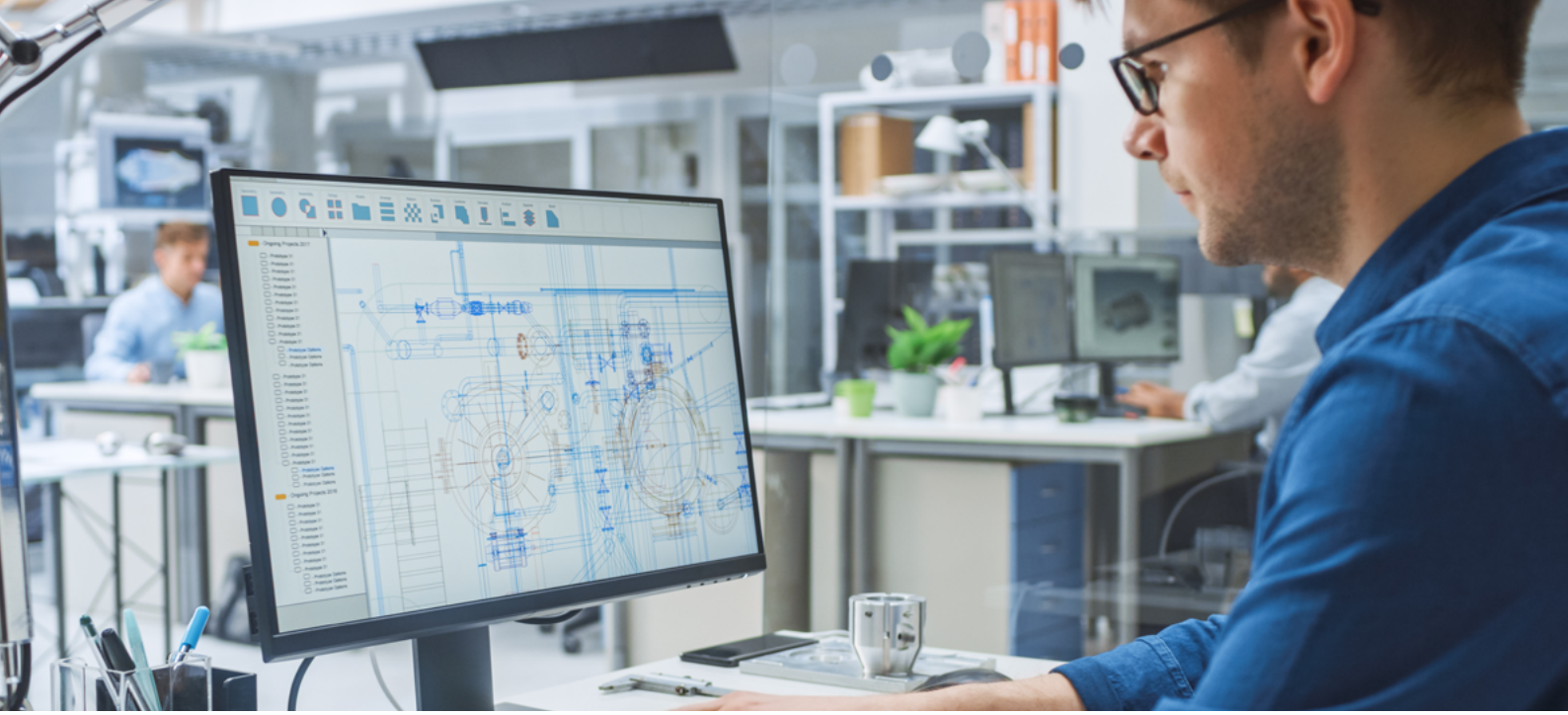
“The first step towards this is with automation tools. For example, the industry is currently developing standards that focus on a model-based format, whereby 3D models carry a significant amount of data. When these models are sent to fabricators, they have all the information they need regarding the standards of that part, whereas before, that data may have been redacted as it moved further down the supply chain.

“What the PEM® team is currently working on is a digital solution that makes the quoting process faster and more accurate. On the manufacturing floor, this software will help with inventory management and reduce the cost of poor quality issues. By creating a solution that addresses needs across each of these levels, we can help these factories survive in the future.

“The idea is to leverage these tools to make things as easy as possible for our customers, so it’s more of a customer experience than a digital transformation for us.

“Where we see this trend moving in the future is towards significant developments in AI, which will have a substantial impact in every industry. How this will affect OEM design at the highest levels is yet to be seen, but a great deal of investment is being made in this area.

“Knowing that the new generation of workers is keen to embrace digital tools, adopting this technology is an additive process for most businesses. Whilst these tools won’t dissolve the need for real-life people, at some point we envision these recent developments with automation leaning more into AI and becoming more interactive.”



What Stage of Digital Maturity is the Industry At Currently?

“Generally speaking, digital tools are yet to be embraced by the manufacturing industry. Whilst some companies are very sophisticated and have the resources to invest in these new technologies, we see from others a lack of understanding of the value these tools can offer.

“As a result, digital transformation is still in its infancy within the manufacturing industry, but it’s something that will definitely open up a new realm of opportunity for those eager to step forward, survive and thrive in this new digital landscape.

“Companies ready to get things moving can start thinking about the processes within their organisation that would benefit from the introduction of digital tools. The way we see it, there are four core areas to focus on. They are:

- Design
- Quoting
- Manufacturing
- Quality performance

“The second step would be to prioritise these areas in terms of the opportunity they present because this will ultimately highlight where to spend the time and effort.”

Thinner, Smaller, Lighter

Zachary Light (Consumer Electronics Market Manager - Americas)

In the Consumer Electronics market, designers are always being encouraged to make products thinner, smaller and lighter to satisfy consumer demand. People want thinner TVs, lighter smartphones and laptops, and smaller, lighter tech in their wearables.

“Some aspects of consumer electronics, such as smartphones, have already achieved the minimum thickness range because of how we use them — too thin, and they’ll bend in your pocket,” says Zachary Light, PEM® Consumer Electronics Market Manager - Americas.

“However, there are still many opportunities for optimising their design structure. For example, if the fasteners used are thinner and smaller, the resulting empty space can then be leveraged to provide a better battery or more storage space. That’s a key trend as far as consumer electronics is concerned.

“Wearable technology faces the same challenges and design engineers will find themselves asking the same questions — how can we improve the battery life while making the product as lightweight and wearable as possible?”

“Reducing thickness is a key challenge, as most wearable products are still bulky and impractical. It’s now up to designers to find innovative ways to fit their wearable products with the tech that consumers have come to expect, and do so while utilising as little space as possible.

“One of the ways this can be achieved is by minimising the use of heavy components. There’s also an opportunity to reduce product weight by making material adjustments. These can be made in components that don’t need to be especially strong from a performance standpoint. Take inserts, for example. If you can switch your brass inserts to aluminium, this adjustment can save grams, which really counts when you’re talking about consumer electronics and wearables.”

Thinner, smaller, lighter is a general trend within consumer electronics. The extent to which it’s prioritised depends on the market segment. Within this trend, one key question is how far it can be taken without infringing on the consumer’s right to repair.

“Thinking about the ‘thinner’ aspect of this trend, the challenge for us in the fastener industry centres around creating an attachment point that doesn’t take up a lot of real estate within a product. If the real estate of the fastener can be reduced (without sacrificing performance), you can reduce the amount of wasted space within that product.”

“One of the solutions we’ve developed is with our line of Tack products. Without the need for a driver, these fasteners can be pressed to fix a component in place, making the heads a lot thinner.

“The issue we’re then faced with is how do we leverage this technology to reduce product thickness while still enabling the right to repair? If products are to be made repairable, this will usually require more removable screws, which then impacts overall weight and thickness.

“Moving forward, we anticipate seeing innovators within the industry coming up with new ways of putting products together which strikes a compromise between the thinner, smaller, lighter trend and the consumer’s right to repair. One of the ways we’ve sought to combat this challenge is with the development of our TackScrew®, which offers all of the benefits of our TackPin® while still being removable.”

Right to Repair

Shane Doody (Applications Engineering Manager)
Ramon Egel (Consumer Electronics Market Manager - Global)
Zachary Light (Consumer Electronics Market Manager - Americas)
Nick Marshall (Field Application Engineer)

The definition of 'Right to Repair' and what it'll entail for Original Equipment Manufacturers (OEMs) is currently vague, as there are several hands at work to draft the regulations, with the EU, New York and California all developing their own Right to Repair legislation.

Generally speaking, the overarching aim of Right to Repair is to produce a more reusable, repairable and customer-accessible device that can be taken apart and recycled at the end of its life, or where the components can be swapped out and replaced.

"The Right to Repair philosophy aims to achieve something similar to what we have in the automotive industry, where you can take your car to any independent shop to be repaired," says Nick Marshall, PEM® Field Application Engineer. "That shop can create or source third-party components, fit them and service them without the need to refer back to the OEM."

"What Right to Repair will achieve is essentially a limit on the OEM's ability to monopolise the service of their devices," says Zachary Light, PEM® Consumer Electronics Market Manager - Americas. "Additionally, it will reduce or eliminate the electronic waste that comes from existing throwaway items. Consumers will be more likely to fix their broken tech than buy a replacement because Right to Repair will make it more possible to do so."

"What we're seeing is a definite trend amongst the big tech companies to move towards common, standardised fasteners," says Nick. "In the past, where they may have used security Torx® drives, they're now replacing these with cross or flat-drives, which are more readily available.

What Challenges Does Right to Repair Present?

“As much as the sustainability and repairability initiative is a positive and necessary one, it poses some challenges, especially in the consumer electronics space,” says Nick. “In the move from using permanent fasteners to more temporary solutions, the options for how people can put things together has become more limited, as welding and adhesives become eliminated.

“Additionally, these changes will drive design engineers towards specific kinds of driver bits for common purposes. But some uncommon drivers are designed to provide a specific function. For example, there’s a driver that enables you to use a thinner screw, but it’s not very common, so what we’re seeing now is design engineers being forced to alter their components so the design can accommodate removable screws with a thicker head and conform to the new Right to Repair standard that’s being pushed.”

“Whether or not consumers will realistically be able to repair their own electronics devices remains somewhat of a grey area,” adds Shane Doody, PEM® Applications Engineering Manager. “Whilst it might be entirely possible for tech-savvy consumers to make their own repairs on bigger components, it’s unlikely they’ll be empowered to work with smaller electronics and micro parts. If any of these parts are dropped or lost during disassembly, you’d have to buy a whole new unit anyway.

“We see Right to Repair making a bigger impact with larger consumer electronics, featuring more easily handled components, and in the automotive industry, too. The legislation will encourage a new way of thinking about how products can be put together, and it will make the tools and parts needed to complete the repairs more readily available to the average consumer.”

Where is Design Headed with Right to Repair?

“Whilst the options for putting parts together may become more limited, there’s also a great deal of innovative fastening solutions available to solve this challenge,” says Nick. “Solutions such as threaded fasteners can offer a viable alternative, as they’re often more reliable than welds or adhesives and they’re recyclable multiple times, too.”

“Unfortunately, using welded fasteners isn’t always possible, for example, in aluminium assemblies,” says Zach. “What Right to Repair is encouraging is innovation in design engineering, particularly for those working with these materials.

“In our recent visit to CES 2023, we saw a repairable laptop where the components on one side of the assembly were still glued down, while components in the other half could be swapped out and replaced. What the designer had created was a laptop where one half supported the consumer’s right to repair, while the other half was built at a lower cost and the whole module could be pulled out and replaced if something went wrong.

“This is something the PEM® team is keen to support design engineers with. With so many fastening solutions available, it can be difficult to know where to start, but our team is always available for insight and guidance where needed. One of the key questions that we tend to lead with is: Will it need to be repairable? Ultimately, this is the key factor that will drive the fastener options that are available to them.”

“In terms of the specific types of fasteners that can help design engineers to meet their Right to Repair targets, there are several solutions available,” says Nick. “For example, you can install inserts into soft components to improve thread life. You can install stand-offs in place of tapped bosses, or use pins or repairable components to replace welds. Additionally, almost any threaded fastener can replace a glue-in solution wherever there’s enough space.”

Sustainability

Brian Bentrim (Vice President Process Innovation & Environmental Sustainability)

The initiative for businesses to become more sustainable is being adopted with increasing speed and dedication across the industry.

Supported by the development of new regulations such as Right to Repair, manufacturers are becoming more conscious of how their production processes and products are impacting the environment.

“In terms of the work PEM® engineers perform, Right to Repair is top of the sustainability initiative,” says Brian Bentrim, Vice President Process Innovation & Environmental Sustainability. “As far as sustainability is concerned with fastener products in general, Right to Repair is a priority because it affects the complete product lifecycle. It’s about enabling the lifecycle of products to become more sustainable.

“The other side to the sustainability initiative comes with the investment into greener production practices, which is quite challenging in the production of fasteners. Generally, fasteners are made using steel and the process involved in sourcing the material is quite carbon-intensive. But there are ways of sourcing and producing steel that are greener and this is something we’re keen to learn more about.

“Right to Repair is the sustainability topic that’s getting the most attention but outside of this, there are several areas where improvements can be made simply by researching the fastener types that are available. When you’re dealing with metal products, choosing the right fastener can have a big impact on weight.”

“For example, if you have a small plastic component and put eight steel screws into it, those eight screws can contribute significantly to the product’s overall weight. If you can switch these screws out for an aluminium alternative, you can reduce fastener-related weight by around $^{2}/_{3}$. That weight reduction can impact the entire product lifecycle from initial shipment to use and end-of-life recycling.

“Parallel to this, when you choose the right fastener, you can improve the longevity of your product, lengthening the time it’s in use and delaying its entry to landfill.

What Are the Key Benefits of Investing in Sustainable Practices?

“A host of benefits come with being more sustainable in business. Generally speaking, any time you invest in sustainable practices and become a better friend to the environment, it benefits society.

“Working with your supplier to make your product more sustainable will create a more stable source for your supply chain, which enables sustainable working practices and is a bonus for ongoing business.”

“Choosing greener fastening solutions will allow you to create a more sustainable product. There’s the reuse facilitated by Right to Repair but separate from this, if it’s possible to break a product into smaller pieces at the end of its life, it makes the recycling process easier.

“As an added benefit, green production practices put consumers’ minds at ease. Today’s consumer is more aware of environmental challenges, more socially conscious and more likely to invest in a product that’s been made with sustainability in mind.

What Technologies Exist That Can Enable a Move Towards a More Sustainable Future?

When it comes to sustainability, three key areas of technological advancement deserve more attention:

1. Steel

“When a product is made entirely with metal, the refinement and alloying required to treat the metal are both carbon-intensive processes.

“Green steel is a developing technology that involves using greener energy sources to produce steel. Because it requires so much energy, green steel tends to be significantly more expensive, but it’s a much better option from a carbon perspective.

“I believe as the technology around green steel and green metals evolves, the price will reduce and we’ll start to see a big uptake in this technology.’

2. Heat Regeneration

“Heat regeneration is by no means a new technology, but it’s yet to be fully explored within our industry. This technology offers a great deal of opportunity. A lot of heat is produced when working with metals and the process equally requires a lot of heat, such as with heat treatment processes and the production of parts.

“This technology allows for the capture and reuse of the heat that’s generated. If implemented correctly, heat regeneration could enable a much greener future for the production of fasteners.”

3. Blockchain

“Blockchain technology introduces traceability to the industry. If you’re working with materials that are the result of minerals drawn from the ground, it’s essential to know that those minerals are being ethically sourced.

“Blockchain provides the ability to track the materials you use. As it becomes more prevalent within the industry, this technology could potentially eliminate bad practices such as slave labour. This will create safe workforces while also empowering consumers to make their own choices regarding where they spend their money, with full knowledge of the production values behind every item they purchase.

How Can Businesses and Manufacturers Become More Sustainable in 2023?

“Thinking holistically about the supply chain and your place in it is important. As a customer, you can hold your suppliers to account, increasing sustainability for both businesses.

“Pushing your suppliers to become more carbon-friendly or reduce single-use plastics in their packaging is a great first step for those looking to make their own business and production practices more sustainable.”

“People are a big part of the sustainability initiative, so in tandem with this is the investment into companies that treat their people ethically. Make sure you’re only supporting businesses and suppliers that are fair to their staff, and are making efforts to ensure everyone in the supply chain is treated properly.

“Investing in quality parts and products is also essential to improving sustainability. We create high-quality PEM® fastener solutions that our customers can rely on. As a result, customers may have some flexibility in their designs to reduce the number of fasteners used without putting end-product performance or quality at risk. The impact of this can be a reduction in weight, part count, design time, production time and cost. All of these benefits ultimately have a trickle down effect and help businesses become more sustainable.

Chapter 3

Opportunities

As we have explored within this report, opportunities exist across several innovative areas within the industry.

Automotive & Electrification

The modern world is changing rapidly and the fastener industry is taking strides to keep up with it. With targets for lower emissions rolled out globally, transport and mobility will look very different in the next ten years, and the fastener industry will play a key role in helping OEMs deliver electric and hybrid vehicles to the masses.

“Something that’s happening currently within the automotive industry is the development of electrical standards,” explains John O’Brien, Electrical Technologist. “While some electrical standards exist, there’s still a long way to go.

“These standards are being written by different organisations within the industry, but the primary aim is to develop standards that will hold companies to account so that when they make a claim about the electrical performance of a component, customers can then be sure certain requirements are met.

“What we’re currently working on in our Technical Centre of Excellence in Galway is a testing capability that’ll enable us to verify components to these standards. This allows us to test our components and prove they meet an international-recognised standard.

“One of the industry trends we anticipate will become more prevalent over the next few years is a coalescence around certain standards to support their widespread rollout. Member organisations such as CharIN, the Charging Interface Initiative, are setting the standards for these new applications of electrical connectivity. Our hope is ultimately to help organisations set those standards by investing in our testing capabilities.”

Consumer Electronics

With movements like Right to Repair now gaining momentum globally, design engineers must uncover new ways of putting consumer electronics devices together.

Implementing these new designs requires new and unique components and technologies. As a result, there are opportunities for people in this role to get ahead of the curve and start their research to expand their knowledge.

Existing in tandem with this movement is the ongoing quest of consumer electronics manufacturers to make things thinner, smaller and lighter — an ambition which, as we have seen, presents its own challenges.

With Right to Repair encouraging design engineers to think differently about the components used in their products, the ambition to make things lighter ultimately presents an opportunity for further innovation within the industry. This requires innovative thinking, design solutions and new technologies.

Explore the Full Potential of the Latest Industry Innovations with PEM® Fasteners

To learn more about upcoming changes, innovations and initiatives in the fastener industry, get in touch with a member of the PEM® team today.

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