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Company Bulletin

for EMC, EMP, HEMP & TEMPEST Protection

Issue 25

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MPE adopts new UKCA marking following Brexit

Quality Assurance Engineer Paul Argent led all activities for the new UKCA marking. Paul polices the ISO9001:2015, environmental policy and CE marking standards at MPE . . . . Read More >

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Faster delivery on pluggable TEMPEST filters

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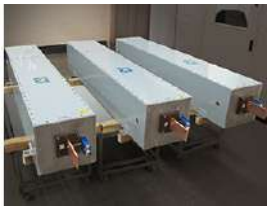
High current filters now standard in HEMP catalogue

MPE has added high current HEMP filters to the standard HEMP catalogue, expanding it to include filters up to 3600A . . . . Read More >



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FAST FACTS ON MPE LTD

- Trading for over 95 years, MPE employs more than 60 people.
- MPE has designed and manufactured in excess of 10,000,000 high performance protection filters and feedthrough capacitors across the last 30 years.
- Many products in continuous service for more than 25 years.
- MPE's portfolio spans over 20,000 custom designs.
- MPE's is certified to the ISO 9001:2015 quality standard, and it's products meet all applicable defence, safety and regulatory standards.

For comprehensive information about MPE's products and services, contact the Sales and Marketing Department, MPE Ltd, Hammond Road, Knowsley Industrial Park, Liverpool, L33 7UL, U.K.
Tel +44 (0)151 632 9100. Email sales@mpe.co.uk. Website www.mpe.co.uk
If you have a friend or colleague who you think might find the MPE Company Bulletin informative, then why not forward it to them?

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Paul Argent – Quality Assurance Engineer

MPE adopts new UKCA marking following Brexit

All of MPE's products offered for sale have been CE marked for a number of years.

Following the UK's exit from the European Union, from 1st January 2022, most goods for sale in Great Britain (England, Wales and Scotland) are required to carry the newly introduced UKCA (UK Conformity Assessed) marking. It covers most goods which previously required the CE marking.

The UKCA marking came into effect on 1st January 2021. However, to allow businesses time to adjust to the new requirements, organisations can still use the CE marking until 1st January 2022 in most cases.

The technical requirements ("essential requirements") of UKCA, and the conformity assessment processes and standards that can be used to demonstrate conformity, are largely the same as has been required for CE marking. The circumstances in which self-declaration of conformity for UKCA marking can be made are also the same as for CE marking.

Paul Argent, Quality Assurance Engineer at MPE, led all required activities regarding this new UKCA marking. Paul polices the ISO9001:2015, environmental policy and CE marking standards at MPE. A holder of the Six Sigma Green Belt since 2003 and with wide experience and expertise gained from quality engineering roles across the north-west of England, Paul has been an integral member of the MPE team for over two years.

So, drawing upon his extensive experience and expertise, Paul has been able to position MPE so as to seamlessly adopt the new UKCA marking. His activities and responsibilities have included a full review of UKCA marking requirements and, following this, the creation of fresh Declarations of Conformity for all of MPE's product ranges. New product labels were also drafted and produced to show the new marking.

So, with Paul Argent having completed all this detailed work, MPE adopted the new UKCA mark in April 2021, well ahead of the 1st January 2022 deadline set by the UK Government. Every single MPE product now features both UKCA and CE marking, with individual and separate UKCA and CE Declarations of Conformity being available on request for all ranges.

MPE product label for UKCA & CE marking

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John Hickey

John, second from the left, with his cycling group at Capel Curig, North Wales

Spotlight on John Hickey

John Hickey was appointed in September 2020 as Mechanical Engineering Design Manager to head up the Engineering team at MPE Ltd, reporting direct to Managing Director David Seabury. Many of MPE's high-performance filter and capacitor products require custom design and manufacture for particular projects and applications, and John oversees their lifecycle from design and development through prototyping and testing to final manufacture. John manages the daily engineering workload, as well as working closely with all other departments to meet their engineering requirements.

John Hickey has extensive skills in 3D CAD, and part of his role is to establish a large range of 3D models to increase the accuracy and efficiency of delivering projects. Further to this, John will modernise filters using the latest industry techniques. This will improve the manufacturability and efficiency of filters, thus strengthening the company's foothold on the market and give MPE improved delivery times. Part of John's role is to guide the world-class team at MPE through R&D projects, keeping them at the forefront of high-performance filter design.

He joined MPE from Power Systems Ltd (PSL) at Speke, Liverpool, a bespoke manufacturer of large, high-pressure stainless steel vessels to explosion-safe ATEX requirements for the pharmaceutical industry. As the Engineering Manager there, he guided a team of nine engineers through international contracts in research and development and introduced a number of significant new systems for improved efficiencies.

For three years from 2015 to 2018 John was Senior Mechanical Design Engineer at the company CCL in Leeds. Their products were bearings, pre-tensioned anchors and pneumatic jacks for structural engineering in bridges of all types and sizes. Before that, from 2011 he had been employed as Applications and Design Engineer at Bibby Transmissions Ltd in Dewsbury, West Yorkshire. There John had managed design, development and FMEA for the production of transmission couplings and torque control parts on applications ranging from naval engines to Formula 1 racing cars to offshore oil and gas extraction.

John Hickey's first position following graduation with an Honours degree in Computer-Aided Engineering (CAE) from the University of Central Lancashire in Preston had been his first tour of duty – again three years – at CCL in Leeds, as their Design Engineer. He had also accomplished a BTEC national diploma in Mechanical Engineering from the Magherafelt campus of the North-East Institute in Northern Ireland. Reflecting his wide-ranging qualifications and career experience in engineering design and development, he has been elected as Incorporated Engineer (IEng) by the Institution of Mechanical Engineers in London.

He and his wife live with their three-year-old daughter and six-year-old son in a village near Northwich in Cheshire. John enjoys participation in various sports activities to maintain health and fitness. For three years he played Gaelic football at county level for Yorkshire, having previously, as a university student in 2008, proudly been an All Britain trophy winner. He is also a keen long-distance leisure cyclist in a dedicated group of five, pictured left at Capel Curig in the mountains of Snowdonia, North Wales.

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Pluggable TEMPEST filters with single, dual and quad outlets

Marcus Wright – Manufacturing Manager, MPE Ltd

Faster delivery on pluggable TEMPEST filters

MPE has been long established as the world's largest and most trusted manufacturer of pluggable TEMPEST filters. The company's present ranges have been supplied for almost 10 years now, with many thousands of these "plug-and-go" units in service globally.

Filters for TEMPEST are countermeasures aimed at preventing eavesdropping on data radiated as signals via conducting lines (such as power, telephone or control line cables). Due to an ever increasing demand for both its UK and EU pluggable TEMPEST variants, MPE has instigated a stockholding of finished units and has also explored ways of reducing the manufacturing lead-time for any models not in stock.

This means that demands for small quantities or urgent requirements can be met straight away, given that most models are available for immediate shipment. Furthermore MPE is now able to supply any units not in stock within a six-week period.

These accelerated lead-times are possible as a result of process improvements following review, but also of MPE's capital investment in new manufacturing technology such as the LVD Strippit P-1525 CNC turret punch press installed during 2020.

Marcus Wright, the Manufacturing Manager of MPE pictured left, commented: "I am delighted that, because of MPE's commitment to investment in manufacturing, we are able to offer a further reduction in lead times. This is as a direct result of the increased flexibility within MPE's in-house fabrication capability."

As previously reported in Company Bulletin Issue 23, all of MPE's TEMPEST filter products are now assigned NATO Stock Numbers, unique codes for NATO organisations to reference and use. The assigning of NATO Stock Numbers to the entire range of MPE TEMPEST filters is testament to their world-leading status and their maturity, performance and reliability in a host of army, navy and air force applications.

All filter components are manufactured and tested at the MPE factory in Liverpool under a stringent ISO 9001 quality regime. Reliability over long service has become the hallmark of MPE TEMPEST filter technology in active duty around the world.

MPE offers a comprehensive range of TEMPEST power line filters of alternative performance specifications. These extend from 6A to 16A filters, which might be used to treat individual power inlets, up to 3000A filters for the hardening of a main building power supply. Over several decades MPE has been supplying TEMPEST products which adhere to the onerous specifications of CESG (the Communications Electronics Security Group at GCHQ) and of the US National Security Agency (NSA) and more recently NATO TEMPEST SDIP-27 and SDIP-29 Standards.

You are invited to download from here a three-page datasheet for the standard UK range of pluggable TEMPEST filters from MPE.

The equivalent information covering MPE's comprehensive European pluggable filter range may be accessed from here.

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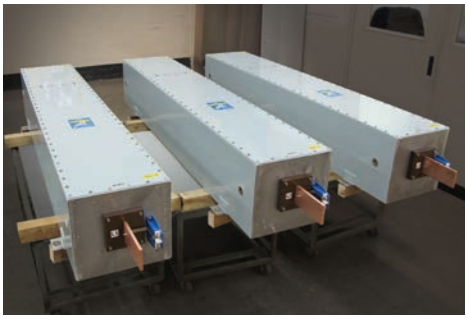
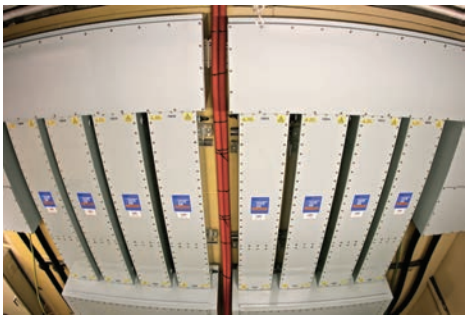
A standard 6A high-performance HEMP power line filter



A consignment of MPE's 1200A HEMP filters prior to shipment



Array of MPE HEMP filters in service at RAF Fylingdales in North Yorkshire

High current filters now standard in HEMP catalogue

In recent years MPE has experienced a growing trend in many applications for high-altitude electromagnetic pulse (HEMP) filters with increasingly high current capability. This phenomenon is attributed to the greater and greater quantities of equipment being installed in the facilities to be protected and its ever growing power requirements. The trend is widespread around the world, including territories as diverse as the USA, Europe and the Republic of South Korea.

For years MPE has been manufacturing and supplying on request high current HEMP filters, up to and including 4800A, which have long remained in service, thereby reducing costly plant maintenance and system downtime.

MPE has previously reported on such installations as far back as Company Bulletin Issue 10, which featured the RAF Fylingdales early warning and military satellite tracking station in North Yorkshire, where MPE's high current filters have now been working for more than six years.

Company Bulletin Issue 13 described the installation of MPE's 1200A HEMP filters in a Department of Defense facility in Virginia, where they have now been in operation for over four years. This has been one of a number of critical defence applications in the USA. Then, more recently, MPE provided its HEMP filters to fulfil a huge 4800A requirement in mainland Europe.

Because of this regular demand for high current HEMP filters, MPE has taken the logical step of adding them to its standard HEMP catalogue, now expanding that catalogue to include filters up to 3600A.

Very different to other manufacturers' offerings, these filters are now available as standard catalogue items and are supplied as a complete solution with all the connecting busbars, gaskets and end compartments required for installation. MPE is the only filter manufacturer to offer this.

What is more, MPE is still the only filter manufacturer to openly publish the independent PCI test reports for its filters on its company website.

MPE's HEMP power line filters consist of a single circuit with no current-sharing elements, thus avoiding the problems inherent in high-current filters which are based on the paralleling of multiple lower current filters. In addition to its HEMP power line filter ranges, MPE continues to manufacture and supply many other HEMP ranges, including control line, data line, telephone line and other truly customised variants.

By clicking here you can download your copy of the latest 22pp catalogue of MPE power line filters to protect your systems against High-Altitude Electromagnetic Pulse (HEMP) and Intentional Electromagnetic Interference (IEMI) threats.

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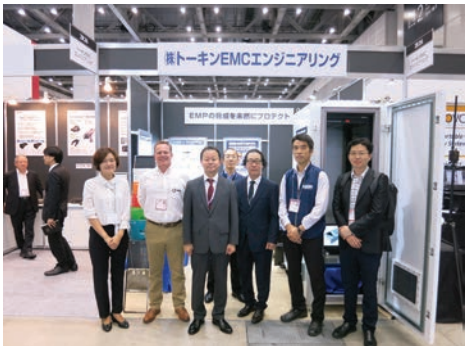

The Techno Science Systems, formerly Tokin EMC, team on their stand at a previous SEECAT exhibition in Tokyo, with President Susumu Matsuoka third left and Paul Currie, Sales and Marketing Director of MPE, second left

From left to right, Mr Matsuoka and Junichi Suzuki of Techno Science Systems on a visit to MPE in Liverpool

Distributor Tokin now Techno Science Systems

On 1st December 2020, following an acquisition of their parent company, the owners of MPE's authorised distributors for Japan, Tokin EMC Engineering, transferred their Systems division to Techno Science Japan, with Tokin being renamed as Techno Science Systems.

Founded in 1990, Tokyo-based Techno Science Japan has a capital of 96 million Yen and annual sales in excess of 3 billion Yen.

This change of ownership provides Techno Science Systems (TSS) with greater operational strength and flexibility for delivering their advanced electronics test, measurement and protection solutions to both existing and new customers. The previous management team has been retained to ensure a seamless transfer, with President Susumu Matsuoka continuing to head up the organisation and the day-to-day EMC/EMP filter operations being managed by Junichi Suzuki.

Founded in 1983 as Tokin EMC, TSS are headquartered in the major city of Kawasaki with a 20-strong, technically highly skilled and experienced team. Offering EMC measurement, anechoic chamber and shielded room design and installation, and EMP protection technology, TSS are trusted partners at the forefront of innovation in Japan's electromagnetics market in the 21st century.

Since their appointment as MPE's authorised distributors for Japan in April 2018, TSS have focused on the fast-growing EMP protection market in the territory, establishing and developing a solid customer base. More recently, TSS have been engaged with large, blue chip contractors, providing expert advice and TEMPEST solutions for maritime defence platforms.

Whilst the continuing global Covid-19 pandemic has prevented the physical event from taking place in 2020, TSS have previously had stands, as pictured left, at the annual SEECAT event (Special Equipment Exhibition and Conference for Anti-Terrorism), staged in Japan's largest convention and exhibition centre, Big Sight in Tokyo.

This three-day event has presented TSS with an excellent shopwindow for showcasing their latest electronics applications which incorporate MPE's world-leading EMC and EMP filters. A recent notable example of this has been a Mil-Std-188-125 compliant HEMP rack from MPE's distribution partners in South Korea, Eretec.

For EMC and EMP product enquiries in the Japanese market, email susumu.matsuoka@tsscorp.co.jp or visit the Techno Science Systems website www.tsscorp.co.jp

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CYBER ESSENTIALS

Paula Boyd – Sales Administrator, SACA UK

Fast-expanding SACA UK gains accreditations

Since its appointment as MPE's authorised UK distributor in September 2020, SACA UK has "hit the ground running" with strong sales from the start.

As a result of the rising levels of business that MPE has experienced within the UK and the increasing number of clients being served, for the first time in its trading history MPE appointed an authorised distributor to supply its products to the UK market.

Benefiting from its degree-level trained engineers and also its ability to provide responses and products in the most efficient manner, SACA UK has already been supplying products for large projects against accelerated timescale requirements. Such requirements have included MPE products being shipped in support of UK forces on active operations overseas and also for one of the Royal Navy's surface ship platforms currently being upgraded at Portsmouth.

Since its appointment, SACA UK has also broadened the number of equipment manufacturers it represents in the UK market. In fact SACA UK is now the authorised UK distribution partner for 15 manufacturers of electronic, electrical and mechanical engineering products from around the world. These range from interconnect and advanced motion control products to sensors, RF and microwave technologies.

Furthermore, following a detailed review of its electronic processes, in March 2021 SACA UK attained its Cyber Essentials accreditation. This provides assurance to clients of the robustness of the company's data and IT systems and their safeguards against online security threats. The certification not only provides clients with increased confidence in the handling of their data but has increasingly become a prerequisite for projects.

In May 2021, again following an in-depth review of its processes, SACA UK also attained Approved Supplier status from BAE Systems Ltd as well as its ISO9001:2015 certification. This current ISO9001:2015 certification can be found at www.sacauk.com/saca-uk-attained-iso90012015-certification/

Having now traded with MPE for over six months, and with sales of MPE filters and capacitors continuing to grow in the UK market, SACA UK has expanded its team with the appointment of Paula Boyd as Sales Administrator. Being office-based and co-located with MPE in Liverpool, Paula is ideally placed to respond to all enquiries and administer orders in as short a timeframe as possible.

Paula Boyd may be contacted on +44 (0)151 632 9190 or paula.boyd@sacauk.com

saca uk

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Hunt Class HMS Middleton (M34) at sea

Hunt Class HMS Hurworth (M39) on patrol in the English Channel

MPE TEMPEST power line filter with low line-to-earth current leakage

TEMPEST power line filters for Hunt Class upgrade

As part and parcel of new systems being retrofitted to the vessels in a major upgrade, in March 2021 MPE manufactured and supplied TEMPEST power line filter sets for four of the six Royal Navy Hunt Class minehunters currently in service. Orders for the remaining two vessels are expected in the near future.

Design assistance for the project was provided to BAE Systems Maritime – Maritime Services at Portsmouth by MPE engineering and sales personnel during the latter half of 2020. Maritime Services is one of three divisions of BAE Systems Maritime, specialising in the repair and maintenance of Royal Navy vessels, as well as product development, naval training and through-life support.

At 750t displacement, 60m length, 10.5m beam and 2.2m draught, Hunt Class mine countermeasure vessels (MCMVs) are the largest Royal Navy warships of GRP construction. That contributes to the vessel's very low magnetic signature required for mine countermeasure operations. Each vessel has a crew of 45 with five officers. The vessels were designed not just for minehunting and minesweeping duties but also for patrol missions.

Traditionally, when installed, the TEMPEST power line filters from MPE would be grounded via a connection to the steel bulkhead of the ship. However, because of the glass reinforced plastic (GRP) construction of the Hunt Class platform, particular attention had to be paid to the earthing solution for the filters.

MPE delivered two custom TEMPEST power line filter designs. They feature low line-to-earth leakage capacitance to meet Def-Stan 59-411 and Mil-Std-461, thus reducing AC leakage current-to-earth. Non-magnetic materials were incorporated where possible to reduce the magnetic signature of the filter, and grounding was provided via external earth studs on both the input and output compartments of the filter.

A high attenuation performance of 100dB was provided in compliance with NATO TEMPEST SDIP-27 and SDIP-29 Standards, across a frequency range of 100kHz to 10GHz.

Filter design and selection were completed in conjunction with BAE Systems Maritime Services. Supplied through MPE's authorised UK distributor SACA UK, the TEMPEST filters were subsequently installed by Babcock International.

MPE's involvement with the Hunt Class platform continues a long and proud history of MPE filters being specified for Royal Navy applications. MPE products have previously been or are currently in operational use on Vanguard and Astute Class submarines, QEII aircraft carriers, Type 45 destroyers, Type 23 frigates, Type 26 frigates and Sandown Class minehunters.

You can download your personal copy of the comprehensive, six-page datasheet on MPE's low-leakage TEMPEST power line filters for marine applications from here

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Array of variable frequency drives in situ

MPE high-current power line filters mounted onto an EMP shield

An MPE engineer uses thermal imaging to check a filter under test

Solving the problem of variable frequency drives

During 2020 MPE was asked by a UK defence client to resolve a site issue where HEMP filters from another manufacturer had been installed – and yet were displaying high temperature rises when loads were increased close to the required operational levels.

The filters were rated between 400A and 1200A and mounted onto an EMP shield. When measured, temperature increases exceeded 25°C, with the filters proving hot to the touch. Left unresolved, this would almost certainly have led to filter failure in the near future, and furthermore the certifying authority would not sign off the installation to allow operations to begin.

A review by MPE showed that variable frequency drives (VFDs) were being used on the application. Tests confirmed that, when these were disconnected, temperature rise was within normal limits, but that, with these drives connected, temperature within the filters increased significantly.

Variable frequency drives work by rectifying mains AC power to DC, then chopping the DC at a higher frequency, which is then used to drive an AC motor. Owing to the technology used, the resulting sine wave contains many harmonics. The total harmonic distortion may be expected to be within 5%, with individual harmonics being up to 3%.

Since the harmonics lie within the pass band of the filter, it tries to attenuate any power present at the given frequencies, and that manifests itself as overheating of the filter. However, because of the advanced design of MPE HEMP filters and the careful selection of their materials of construction, they are far less susceptible to such damaging harmonics.

Accordingly, in late 2020 the original filters installed on the site were replaced by ones designed and manufactured by MPE. When tested with VFDs in the circuit and with full operational loads connected, the maximum temperature rise measured was below 11°C, over 50% lower than the temperature rise recorded on the previous manufacturer's filters. As a result, the site is now fully commissioned and operational, having been signed off successfully by the certifying authority.

Detailed application notes on the use of MPE HEMP power line filters in conjunction with variable frequency drives may be downloaded from here.

To discuss your company's specific requirements, please call MPE's specialist Technical team on +44 (0)151 632 9100 or email sales@mpe.co.uk