MPE
Quality, Reliability, Performance

MPE 90th Anniversary 1925 – 2015

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 6

MPE PEOPLE

MPE celebrates its 90th anniversary with record exports

This year MPE Ltd is celebrating the company's 90th anniversary with an increasing demand for its production. Meanwhile the proportion of exports continues to show significant growth, as more than half of MPE products now go to service overseas applications.

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Spotlight on John Jephcott

John Jephcott, Key Account Manager of MPE, has broad experience in technical engineering sales going back to 1992, after previously working at three different Midlands companies.

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MPE TECHNOLOGY

Integrating EMC suppression into high-power connectors for military vehicles

Military vehicles often have separate power connectors and EMC filters which together take up too much valuable space and add weight.

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Preserving information security at data centres

The TEMPEST threat to information security was first recognised by the US National Security Agency (NSA) and GCHQ in the 1960s. Examples of sites at risk are data centres handling sensitive personal and financial information, where power line cables are vulnerable to electronic eavesdropping.

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MPE DISTRIBUTOR NEWS

MPE hosts major event in Liverpool for its distributors around the world

13 of MPE's territory distributors, 21 people from 13 different countries, participated in a major event at MPE at the end of June 2015 with a packed programme.

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IMCA Elektronik stand at IDEF 2015 is ideal shop window for MPE in Turkey

The 12th International Defence Industry Fair (IDEF) took place from May 5th to 8th at the TÜYAP Fair Convention and Congress Center in Istanbul, Turkey.

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MPE APPLICATIONS

MPE's powerline filters prevent EMI from affecting test chambers

For more than 15 years MPE has been supplying high-performance CleanPower™ and powerline filters to the long-established shielded room and test chamber manufacturer Rainford EMC Systems Ltd, which became MVG-

EMC, EMP & TEMPEST protection solutions for tactical shelters

Over the years the EMC, EMP and TEMPEST protection solutions from MPE have been provided to large numbers of mobile tactical shelter projects for Western defence forces. Such programs have included the contract to supply ground control stations for the Watchkeeper Unmanned Aircraft System

EMC following its acquisition in 2012 by the Microwave Vision Group.

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(UAS), as pictured here, to fulfil the MOD's ISTAR objectives.

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FAST FACTS ON MPE LTD

- MPE has traded since 1925 and employs over 50 people.
- MPE has designed, manufactured and shipped in excess of 8,000,000 high-performance EMC, EMP and TEMPEST filters and feedthrough capacitors in the last 30 years.
- Many products have been in service for more than 20 years with undiminished performance.
- MPE has a portfolio of over 20,000 custom product designs to meet all possible requirements.
- The MPE factory at Knowsley, Liverpool, is certified to the quality standard ISO 9001:2015, and its products meet all applicable defence 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. Fax +44 (0)151 632 9112.
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?

MPE
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Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 6

David Seabury, Managing Director of MPE Ltd, cuts the celebratory cake marking the 90th anniversary of the company, during the event in Liverpool for MPE distributors at the end of June

An historical Dubilier capacitor from the beginning of the company at North Acton, London, in 1925

Modern-day feedthrough capacitors designed and manufactured by MPE

MPE celebrates its 90th anniversary with record exports

This year MPE Ltd is celebrating the company's 90th anniversary with an increasing demand for its production. Meanwhile the proportion of exports continues to show significant growth, as more than half of MPE products now go to service overseas applications.

Significant milestones in the company's long history have been as follows :-

1925

The Dubilier Condenser Co (1925) Ltd was established as a public company, manufacturing industrial capacitors for radar, radio and early television, as well as EMC filters, from a site in Victoria Road, North Acton, London W3.

1947

After the severe bombing of the capital during World War 2, manufacturing was relocated to Knowsley, Liverpool.

1981

The company was acquired and became MPE-Dubilier, then MPE Ltd, concentrating on more specialised capacitors and EMC filters.

1986

The MPE factory was first certified to the quality standard ISO 9001.

2002

MPE became privately owned.

Employing over 50 people, MPE has designed, manufactured and shipped in excess of 8,000,000 high-performance EMC, EMP and TEMPEST filters and feedthrough capacitors over the past 30 years. In fact many of its products have been in service for more than 20 years with undiminished performance.

Since its original establishment back in 1925, MPE has maintained a history of regular innovation and introduction of market-leading products. Pictured at centre left is an example of an industrial capacitor from the 1920s – which was considered the "new technology" of its time. Below that are typical modern feedthrough capacitors, the fundamental component of all MPE filters.

Moreover, alongside a busy ongoing programme of investment in new product lines, MPE's Engineering Department at Liverpool provides a rapid prototyping service employing specialist test facilities, a dual chamber screened room, and proprietary filter and capacitor design software. MPE's portfolio of over 20,000 custom product designs includes application-specific mounting and cable entry options.

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 6

The winding shop at MPE 20 years ago

How the winding shop has changed dramatically by 2015

Traditionally a global supplier of EMC filters for wide-ranging defence applications such as military vehicle and weapon systems, tactical shelters, base stations and latterly HEMP filters to MIL-STD 188-125, stealth ships and the Eurofighter, MPE has been expanding strongly to embrace EMC, EMP and TEMPEST protection applications in many new and emerging markets.

These range from process control, SMPS, IT equipment, datacentres and EMC test chambers through to telecomms, satcomms, building services, hospital scanners and the latest intelligent lighting.

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 6

John Jephcott

Spotlight on John Jephcott

John Jephcott, Key Account Manager of MPE, has broad experience in technical engineering sales going back to 1992, after previously working at three different Midlands companies in the roles of Technical Manager, Service Manager and initially Technician Engineer, where he was trained in all aspects of engineering.

For five years from 1992 he was Sales and Marketing Manager for EMC/RFI suppression solutions at Phase Two Electronics Ltd in Birmingham (from 1995 part of the Steatite Group). Subsequently John was Product Manager – EMC Filters for eight years at Arcotronics of Towcester, Northants, a major league manufacturer of EMC/RFI filter products. There he provided product support worldwide and carried responsibility for the UK sales and marketing of filter products as well as for UK and overseas distributors.

In December 2005 John joined MPE as Sales and Marketing Manager and now, as Key Account Manager, he uses his immense experience and expertise in EMC, EMP and TEMPEST solutions to develop and maximise new sales opportunities and provide an enhanced level of service to existing customers in the UK and Ireland. Internationally, he supports MPE's growth in world markets in tandem with its distributor network: that strategic focus includes the delivery of expert technical presentations, joint customer visits and participation on distributors' stands at key trade exhibitions overseas, principally in the defence sector.

John Jephcott lives at Tamworth, Staffordshire, and among his leisure interests he is a lifelong follower and season ticket holder of Birmingham City Football Club. He also enjoys live music gigs, typically the classic rock and blues genres.

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Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 6

An example of a high-power, filtered connector incorporating EMC suppression from MPE

Integrating EMC suppression into high-power connectors for military vehicles

Military vehicles often have separate power connectors and EMC filters which together take up too much valuable space and add weight. Now integrating the required EMC suppression for the first time ever into the connectors themselves, MPE has developed techniques enabling the capacitor to be wound into the backshell of the high-power military connector, where the greater the space for windings, the greater the EMC suppression that can be achieved.

As applications become ever more sophisticated, complex and power-hungry, connector manufacturers have identified a distinct trend towards increased power and voltage requirements on such applications as military and electric drive vehicles, aircraft and communications base stations.

Many military vehicle applications traditionally utilise a box-type EMC filter that may add unnecessary cost and weight and may take up too much space. Hence MPE is now working with interested connector manufacturers to produce connectors with integrated EMC filtering, in a footprint within very tight physical constraints.

The challenge is to deliver a high degree of suppression inside the envelope of a filtered connector that provides mechanical compliance to MIL-DTL-38999 Series III and EMC suppression compliance to DEF STAN 59-411 and MIL-STD-461. These are for standard ranges of MOTS (Military-Off-The-Shelf) filters suitable for EMC suppression of COTS (Commercial-Off-The-Shelf) equipment on military vehicles.

Typically, the use of single pole contacts can create an electrical interface that exceeds typical interconnect requirements via a hyperbolic socket contact construction. The latter distributes normal forces over a high percentage of the mating surface, to ensure a smooth and even engagement force with exceptionally high performance under vibration. The large surface area of the socket contact also results in a very low contact resistance, enabling much higher current ratings which suit those power-hungry applications. Such connectors are now commonly available from a wide range of connector manufacturers.

MPE
Quality, Reliability, Performance

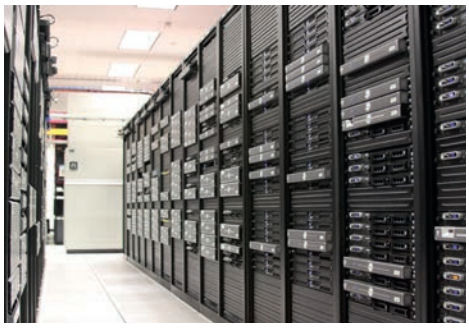
Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 6

Preserving information security at data centres

The TEMPEST threat to information security was first recognised by the US National Security Agency (NSA) and GCHQ in the 1960s. Governments, armed forces, municipal authorities and companies now share this concern that electrical and electronic equipment such as computers and peripherals give off unintended electromagnetic emanations which can then be reconstructed beyond the building boundary as intelligible data. Countermeasures are aimed at preventing eavesdropping on data radiated as signals via conducting lines such as power, telephone or control line cables.



The evidence is that TEMPEST countermeasures are becoming as important for information security in the civilian world as in the military arena. Examples of sites at risk are data centres handling sensitive personal and financial information, where power line cables are vulnerable to electronic eavesdropping.

Paul Currie, Sales and Marketing Director of MPE, explains: “High-speed information-bearing signals are the ones most likely to couple onto the low impedance, copper power cables trailing through a data centre, and then be most vulnerable to interception beyond the building boundary. Accordingly, to be effective, the electrical filters designed for TEMPEST anti-eavesdropping applications have to perform across the full frequency spectrum to Super High Frequency or SHF (3GHz to 30GHz), and above.

“MPE filters with incorporated feedthrough suppression capacitors do just that. Commercial grade equipment filters, employing two-terminal capacitors and designed for suppression of EMI up to typically 30MHz, will fall into resonance well before the SHF band, and are therefore unsuitable for TEMPEST uses.”

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 2400A filters for the hardening of a main building power supply.

Now a critical consideration of any data centre manager is that installed TEMPEST filters will be reliable over time. The undiminished long-term performance of installed filters becomes highly significant when most cannot be accessed easily to survey or replace – having been installed deep within building infrastructure.

So, having been originally designed to support mission-critical military applications, MPE’s EMI, EMP and TEMPEST filters apply the most stringent design margins to ensure maximum in-service reliability. MPE has also – over several decades – supplied TEMPEST products which adhere to the onerous specifications of CESG (the Communications Electronics Security Group at GCHQ) and of the US NSA and more recently NATO SDIP Standards.

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 6

250V AC, 50/60Hz, 16A MPE TEMPEST powerline filter for information security at data centres

Typical 5A to 100A MPE TEMPEST powerline filters for data centres

Filters contain resistive and reactive elements that are all at risk of in-service degradation, which may lead to failure. Although the electrical supply would be expected to cope with the possibility of a filter failing from a short circuit, it is the prospective loss of service that is of most concern to the data centre manager. The filter component at greatest risk of in-service failure is the capacitor.

However, filters such as MPE's incorporating capacitors manufactured from self-healing, high-reliability, metallised plastic film would generally be expected to be fully reliable for the intended lifetime of an installation.

MPE manufactures power line filters which support the highest level of TEMPEST hardening, providing very high insertion loss performance (dB against frequency in Hz) across the full frequency spectrum from Very Low Frequency (VLF) to Super High Frequency (SHF). Hence the performance of MPE filters comfortably exceeds the industry benchmarks for mains supply applications, which can be as high as 100dB in a frequency range across 10kHz to 10GHz.

Housed in electroplated steel cases, TEMPEST filters from MPE are of compact size for easy, flexible, bulkhead or chassis mounting into the rack systems of data centres, and include product options where low earth leakage is of critical importance.

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

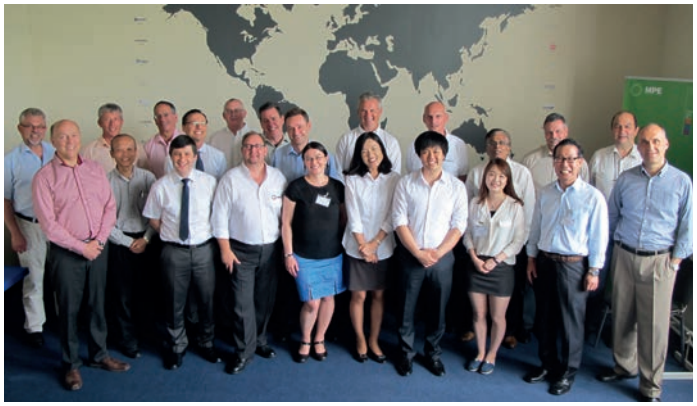
Issue 6

A practical demonstration for distributors in the laboratory at MPE

One of the company presentations to distributors at MPE

Group of MPE distributors tour Liverpool Football Club, Anfield

MPE hosts major event in Liverpool for its distributors around the world



The distributor group on its memorable visit to MPE. Back row, left to right: Erich Thomich – Electrade, Dieter Muehlberger – Electrade, Avi Pines – Aviem, Roberto Picker – Ampere, John Parsons – MPE, Tom Griffin – Technical Sales Solutions, Marcin Hamberg – Radiotechnika, David Seabury – MPE, John van Leeuwen – Accelonix, Neil Murthy – Strongfield, Terry Murch – Technical Sales Solutions, Cenzig Karaosmanoglu – IMCA. Front row, left to right: Keijo Hokkanen – Amitronic, Dave Feng – EMtrek, Fred Morelli – Euromip, John Jephcott – MPE, Janina Nowak – Radiotechnika, Kelly Cho – Eretec, Jong-Nam Kim – Eretec, Young In Na – Eretec, Jun Sun Park – Eretec, Cemal Alpay – IMCA.

13 of MPE's territory distributors, 21 people from 13 different countries, participated in a major event at MPE at the end of June 2015 with a packed programme. The agenda included updates on MPE's strategy and recent investments, a facility tour, practical training on products and testing methods, a new products session including hands-on demonstrations, the MPE Distributor Awards and various social activities.

During the event, MPE took the opportunity to 'walk' the assembled group through both its engineering and manufacturing processes in some detail, to achieve a better understanding of the meticulous steps taken by MPE when answering enquiry requests or meeting production orders. In addition MPE updated the group on six new product developments, finishing with a practical demonstration of the newest one. Other demonstrations were conducted to show MPE's high voltage, insertion loss, temperature rise and pre-compliance testing.

Distributor Awards were presented in three categories, and the winners and runners-up were as follows:

Top Distributor Award

Winner – Norshield (Norway)

Runner-Up – Euromip (France)

Individual Project Success

Winner – Technical Sales Solutions (USA)

Runner-Up – Eretec Inc. (South Korea)

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 6

Visiting the historic Royal Liver Building at Pier Head on the Liverpool waterfront

A convivial evening at Liverpool's Albert Dock enjoyed with gusto by everyone

The venue for the final dinner of the MPE distributor event was the Panoramic 34 restaurant high up in the 40-storey Liverpool West Tower. Seated around the table, clockwise from front bottom, left to right, are: Janina Nowak – Radiotechnika, Dave Feng – EMtrek, Cindy Fang – EMtrek, Jan Nalborczyk – MPE, Jun Sun Park – Eretec, Young In Na – Eretec, Keijo Hokkanen – Amitronic, John Parsons – MPE, Jong-Nam Kim – Eretec.

Sales Growth Award

Winner – Radiotechnika Marketing (Poland)

Runner-Up – IMCA Elektronik (Turkey)

Included in the busy programme of social activities, MPE hosted three dinners for the distributors, the last of which was in the Panoramic 34 restaurant, on the 34th floor of Liverpool's 40-storey West Tower, the third tallest building in the UK outside of London.

Trips for the distributors as a group included a river cruise on the Mersey and a tour of Anfield, the iconic stadium of Liverpool Football Club.

David Seabury, Managing Director of MPE, commented: "Not only did the event allow us to celebrate the company's 90th anniversary with our partners from around the world, but it also provided a great forum to increase our partners' knowledge of recent changes and improvements, from both a company and a product perspective. From feedback that has been received after the event, it is clear that we got the balance of work and celebrations just right – and that our distributors have gone away enthused and reinvigorated regarding MPE and our products."

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 6

The TÜYAP Fair Convention and Congress Center in Istanbul

IMCA Elektronik stand at IDEF 2015 is ideal shop window for MPE in Turkey

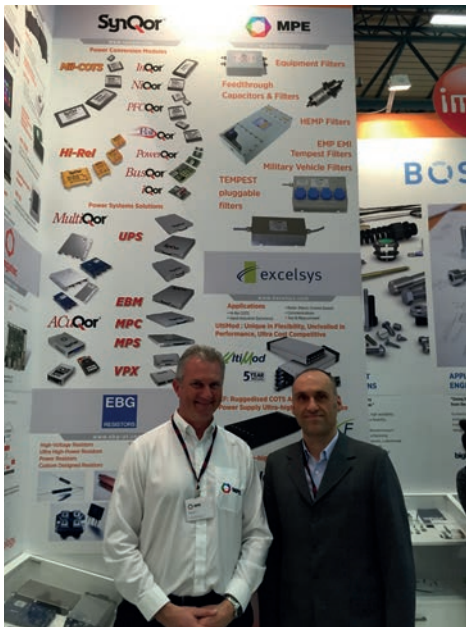
The 12th International Defence Industry Fair (IDEF) took place from May 5th to 8th at the TÜYAP Fair Convention and Congress Center in Istanbul, Turkey, and MPE was one of 14 suppliers represented on the stand of their distributor IMCA Elektronik. The biennial IDEF is the biggest defence industry fair in the Eurasian region and one of the top four in the world, with an increasing number of participating countries, delegations and companies.

Since the appointment of IMCA as MPE's distributor in Turkey just over two years ago, MPE and IMCA have worked together very closely, with many customer visits and seminars being conducted. These initiatives have resulted in sales into Turkey expanding significantly, so that Turkey has represented one of MPE's fastest growing sales territories in the last two years.

Founded in 2002 and located in Istanbul like IDEF, IMCA Elektronik (www.imca.com.tr), is a well-respected distributor to the Turkish defence and aerospace markets. Specialising in the supply of high-technology and niche products, IMCA focuses on meeting the customer's technical requirements, whether this be with an off-the-shelf solution or a custom design.

As at IDEF 2013, the company was pleased to display an extensive range of MPE's EMC, EMP and TEMPEST filters and feedthrough capacitors on its stand at the 2015 exhibition, attracting widespread interest from the visiting buyers, specifiers and users of military equipment systems.

www.idef15.com



David Seabury of MPE with Cemal Alpay, Managing Director of IMCA Elektronik, on the IMCA stand at IDEF 2015

The busy IMCA stand at IDEF featured ample wall space for detailed product information, above cabinets which displayed many of the products themselves with technical literature

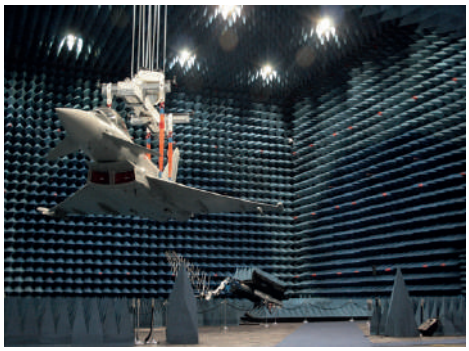
Here IMCA's suppliers are gathered outside a typical Turkish bazaar, overlooking the Bosphorus strait in Istanbul. David Seabury, Managing Director of MPE, is seventh from the left, on the back row

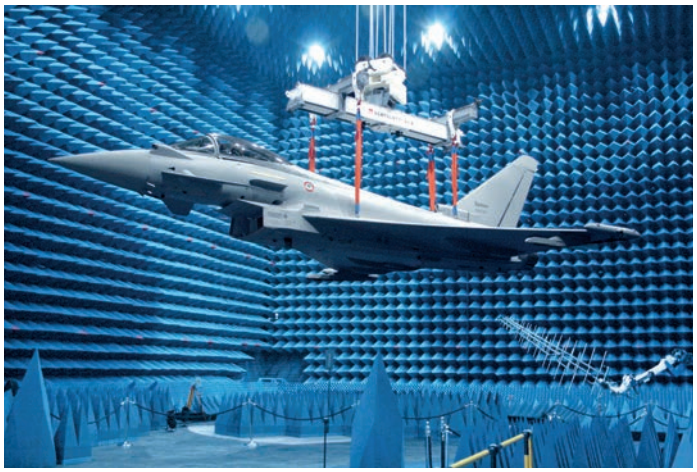
MPE
Quality, Reliability, Performance

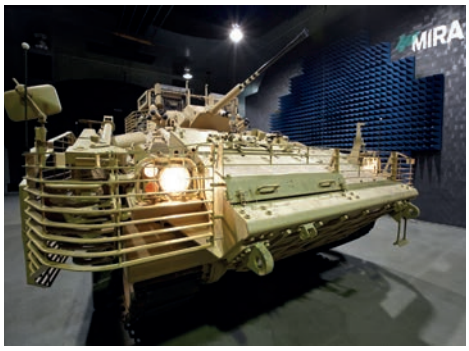
Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 6







MPE powerline filters mechanically fitted and awaiting electrical connection on the outside of an MVG test chamber

MPE's powerline filters prevent EMI from affecting test chambers

For more than 15 years MPE has been supplying high-performance CleanPower™ and powerline filters to the long-established shielded room and test chamber manufacturer Rainford EMC Systems Ltd, which became MVG-EMC following its acquisition in 2012 by the Microwave Vision Group (www.microwavevision.com).

The images above show a Eurofighter Typhoon and British Army Warrior armoured infantry fighting vehicle (AIFV) under EMC test in anechoic chambers manufactured and installed by the Microwave Vision Group (MVG). MPE powerline filters are fitted at the power inlets of these test chambers to shield them against EMI and RFI interference.

MVG-EMC (www.mvg-emc.com), comprising Rainford EMC Systems (REMC) and Advanced Electromagnetics Inc (AEMI), is now regarded as being the most reliable single source and among the market leaders in anechoic chambers and absorbing materials for antenna and EMC testing.

In September 2014 MVG-EMC moved a short distance to a bigger and better location at Haydock, St Helens, Merseyside. At 34,000 ft^2, this new, energy-efficient site is better equipped to serve the needs of clients and supports the Microwave Vision Group's growth strategy in seeking to provide the very best in RF-shielded anechoic chambers and absorber materials in the global antenna and EMC testing market.

MPE has been providing single-phase and three-phase CleanPower™ and powerline filters, mainly in current ratings from 6A to 100A. They are fitted at the power inlets of MVG-EMC's shielded rooms and test chambers, which are sold all over the world. These facilities may be either large, fixed installations

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 6

MPE powerline filters mechanically fitted and electrically connected to the doors of an MVG shielded room

typically for defence, aerospace, automotive, satellite, telecomms and university research applications – or indeed smaller, mobile systems such as MRI scanners for hospitals and clinics.

John Noonan, Managing Director of MVG-EMC, commented: “Our international reputation means everything to us. We deliver top manufacturing quality, reliability and performance in our shielded rooms and test chambers and set the bar very high indeed for all our equipment suppliers. That is exactly why MPE has been a trusted and preferred supplier of our EMC filters for so long and will continue to be so. The compact size and weight, low heat dissipation and reliability of MPE filters make them ideal for integrating into MVG-EMC’s anechoic chambers.”

Paul Currie, Sales and Marketing Director of MPE, responded: “We are justifiably proud of such recognition that our EMC filters maintain the ultimate in high performance over years of service.”

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 6

EMC, EMP & TEMPEST protection solutions for tactical shelters

Over the years the EMC, EMP and TEMPEST protection solutions from MPE have been provided to large numbers of mobile tactical shelter projects for Western defence forces.

Such programs have included the contract to supply ground control stations for the Watchkeeper Unmanned Aircraft System (UAS), as pictured here, to fulfil the MOD's ISTAR objectives.

The Thales Watchkeeper program is the largest UAV program in Europe. On 29th September 2014 the MoD revealed that an undisclosed number of Watchkeepers had become fully operational and sent to Afghanistan. Carrying a twin payload of an electro-optical/infrared sensor and a synthetic aperture radar, the aircraft were stationed at Camp Bastion to provide force protection for British troops as they drew down from Afghanistan towards the end of the year. Some 140 flights were conducted for eight hours a day until operations ceased in mid-October.

One reason the Watchkeeper was deployed so late in the conflict was to use its dual-mode synthetic aperture radar and ground moving target indication to identify Taliban fighters attempting to hide under the cover of dust storms.

The ground control stations protected by MPE's installation-type filters have always been integral to the Watchkeeper system and others of its kind.