

Advanced Thinking in Advanced Materials



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NEWS RELEASE

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July to September 2016

Morgan Partners with Penn State as Part of World-Class Carbon Science Center of Excellence

JULY 2016

Morgan Advanced Materials, a global leader in the development and deployment of advanced material technologies, has unveiled plans to establish a cutting-edge Carbon Science Center of Excellence at Pennsylvania State University, USA, aimed at driving global developments in the field of carbon research.

During an announcement made at the Carbon 2016 conference held at Penn State, Mike Murray, Chief Technology Officer at Morgan Advanced Materials, revealed that the new Center of Excellence would be located in Innovation Park at Penn State, placing it in close proximity to the university's top talent and facilities. Over the course of three years, Morgan is expected to make a multi-million pound investment aimed at establishing a truly world-class research facility. Once operational, the center is expected to continue to create a range of highly-skilled research posts over the next few years.

The partnership with Penn State will combine resources and experience from both sides, creating a synergy that will enable significant progress in the development of carbon materials for a range of sectors and applications. The Center of Excellence, which will be the third of its kind for Morgan globally and the first in North America, will play a vital role in the further development of Morgan's core competencies in the areas of materials and application engineering. Over the longer term, the findings generated by the center will support Morgan in its mission to deliver world class materials science solutions that meet the engineering challenges of customers worldwide, safely and efficiently.

Mike Murray explained: "For us, the decision to work with

Penn State was a natural one. As a world leader in carbon-related research, Penn State has an unrivalled reputation for innovation in its field, which we believe will add real value for our customers. The partnership will help accelerate our development of new products and capabilities, enabling us to continue to meet the future needs of our customers more quickly, efficiently and comprehensively."

Pennsylvania was seen as the ideal location for the new facility on account of Penn State's cutting-edge academic research and proximity to a number of Morgan's key manufacturing sites.

Neil Sharkey, Vice President of Research for Penn State University, explained: "The collaboration is a win-win situation for all involved. Our commitment to developing new methodologies and making further scientific discoveries in carbon science is closely aligned with Morgan's company vision, mission and commitment to the markets it serves. Morgan's expertise and commercial insights will provide our researchers with a solid foundation to deliver commercially viable solutions that distinguish both Penn State and Morgan in a fiercely competitive marketplace, while contributing to job creation and economic development in the Pennsylvania Commonwealth."

Mike Murray added: "Support from Penn State, the State of Pennsylvania's governor's action team and the Chamber of Business and Industry of Centre County has been vital in making this venture a reality. By working collaboratively, we envisage our discoveries will drive the industry forward, pushing the boundaries of technological innovation in the years to come."



High-Density, Defect-Free PZT Components

JULY 2016

Morgan Advanced Materials, a global leader in the development and manufacture of advanced ceramic materials, has announced the introduction of high-density, defect-free Lead Zirconate Titanate (PZT) ceramic components to its established technical ceramics portfolio.

By precisely modifying one of its innovative core processes to optimise microstructural control and enable enhanced machining, Morgan has been able to reimagine its popular soft and hard piezoelectric ceramic materials to create high-density variants, which comprise grain sizes between 2 and 4 μm and pores below 3 μm .

Ideal for high frequency transducer applications as well as extruded products, the development of this new fine grain, defect-free piezoelectric ceramic will enable Morgan to meet the demands of its customers in fields such as medical imaging and consumer electronics. It is also well suited to the military and aerospace sectors and low power consumption applications.

Retaining all the attributes of the manufacturer's original PZT ceramic, the new defect-free alternatives will become the material of choice for OEMs working amidst the device miniaturisation trend that is impacting many sectors, from augmented reality in the electronics market, to ultrasonic printing, high-frequency 1-3 composites in medical imaging, and finger print scanning within the security sector.

With an enhanced microstructure, the PZT can be diced finely (30-50 μm pillars) and machined more than its traditional counterpart, to create strong, reliable, high-performance component parts for environments where space is at a premium.

Florence Godfrin, Materials and Applications Engineer for Morgan, comments on the importance of this material innovation: "Like many of our material innovations, our defect-free PZT is a direct result of a real customer need, initiated back in 2013 when we were tasked with producing a PZT product that had high density and low porosity. From there, we used the same core manufacturing process to develop and research other material improvements across both our soft and hard piezoelectric ceramics.

"The distinct characteristics of this new PZT material have been found to offer improved machinability and increased mechanical strength over conventional materials. This is especially beneficial for actuator applications, in which our fine grain defect-free PZT can deliver improved reliability, higher driving fields and lower driving voltages.

"At this stage we have manufactured a number of different small components using the new defect-free material, with a number of larger products set to benefit from the innovation in due course, which will increase the piezoelectric properties as well as the coupling of the parts to deliver real benefits in sonar and high power applications."

Morgan to Add Hafnium Oxide to Support Demand in Oil and Gas

JULY 2016

Morgan Advanced Materials has added Hafnium Oxide (HfO) to its portfolio of advanced materials for the oil & gas sector as it aims to expand its market offering in line with evolving market demands.

The material, also known as Hafnia, bears a number of similarities to materials such as Magnesium Oxide (MgO) and Zirconium Oxide (ZrO₂) in terms of compound structure while boasting a number of performance advantages over its counterparts. Ideal for high temperature thermocouples, Hafnia can be used in temperatures of up to 2500°C (4532°F) whereas, for instance, MgO starts to interact with thermocouple wires at 1500°C (2732°F) despite having a similar melting point.

Furthermore, the band gap is a lot higher for Hafnia, making it better suited to providing insulation at high temperatures. Hard fire Hafnia is also significantly harder than MgO, providing greater physical resistance.

Health and safety regulations around the use of thermocouples prohibits the use of toxic materials. This is where Hafnia can be seen as a preferable alternative to Beryllium Oxide (BeO), since it is non-toxic and requires no specialised disposal, unlike BeO.

Samuel Wood, Strategic Account Manager at Morgan Advanced Materials commented, "While Hafnium Oxide has already been on the market, the decision was taken to include it in our product offering to provide a wider range of materials to meet the requirements of our rapidly expanding global customer base.

In short, Hafnia has a number of properties which make it a more viable option when compared to many alternative materials."

Morgan Meets Gas Metering Demand with Technical Glass Feedthrough and Ultrasonic Sensor Solution

JULY 2016

Morgan Advanced Materials has brought to market a technical glass feedthrough solution offering enhanced-performance for residential, bulk commercial applications and industrial gas metering, allowing safer operation in order to ensure full legislative compliance.

The global smart meter rollout initiative has been fuelled by the demand for solutions which allow for greater transparency around energy consumption. Morgan's technical glass feedthrough provides meter manufacturers with the necessary level of protection to withstand temperatures of 650°C (1202°F) and above, whilst maintaining hermetic seal, meeting the precise regulatory requirements for industrial, domestic and bulk commercial applications.

Morgan's feedthroughs are ideal for the high volume production required to meet the demands of a rapidly expanding market without compromising on quality. They are available with numerous pin, flange and size options for custom matching to a variety of meter types.

Morgan's technical glass offers vastly superior thermal performance when compared to glass alternatives and retains many benefits of pure ceramic, lending itself more readily to high-volume manufacturing.

Oliver Ridd of Morgan Advanced Materials explained: "Fitting new metering technology to a pre-existing gas supply isn't a one-size-fits-all task, which is why we have applied several decades of technical design and manufacturing expertise to create feedthroughs that can be easily adapted to suit any meter, delivering both optimised performance and safety as a prerequisite. Drawing on its industry-leading sensor and

transducer research and development centre, Morgan has delivered a comprehensive solution which fully addresses the needs of our customers."

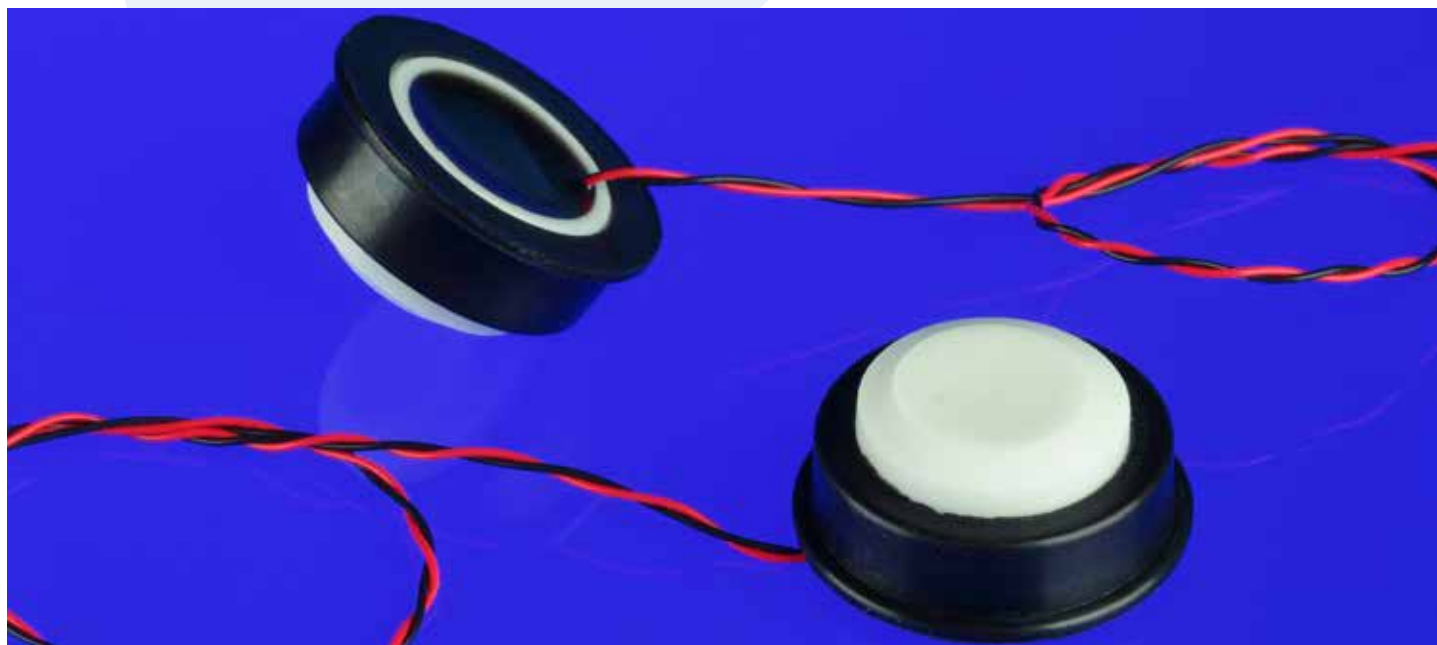
Morgan's technical glass feedthroughs are available as part of a package, with either standard or customised gas metering sensors, allowing excellent continuity of design and quality.

Sensors are available for individual applications and are suited to a range of frequency and environmental tolerances. For industrial applications, these sensors boast an operating temperature of up to 250°C (482°F) and pressure tolerances of more than 200 bar.

For residential applications, sensor options are available from 200kHz to 500kHz, with the availability of additional customised options available. Morgan's 400kHz sensor offers market leading sensitivity and bandwidth and enables easier use and increased performance for those at the initial stages of meter design and manufacture. Each option operates comfortably under 15bar pressure and at 80°C (176°F).

Oliver Ridd concludes: "As global energy suppliers strive to install smart meters, Morgan is meeting the demand for cost-effective, high performance technical glass feedthroughs and sensors.

"Our simplified, adaptable product design and lean manufacturing processes position us at the forefront of high-volume production for this integral product. This, combined with our expertise in design, development and manufacture of sensors, allows for a competitive and user-friendly solution for our global customer base."



Partnership with Morgan delivers measurable benefits

JULY 2016



A working partnership between Morgan Advanced Materials and Renishaw, a global company specialising in industrial metrology and spectroscopy, continues to go from strength to strength.

For more than a quarter of a century, Morgan has helped ensure accuracy in the measurement of complex shapes through its ability to supply high-precision alumina ceramic stylus stems for touch trigger probes used for a variety of specialist applications.

In order to ensure optimal component performance and that components will fit where they need to, high-accuracy verification is needed and high-quality measurement tools are a fundamental part of this process.

Used in product development, manufacturing and assembly, the role of a touch trigger probe is to measure the physical geometrical characteristics of complex objects including products and tooling. Attached to co-ordinate measurement machines (CMMs) or high-speed computer controlled machines providing in-process measurement, the probe measures points on the surface of an object according to a three-dimensional coordinate system.

As the contact probe moves around the object, it registers the position and quantifies the geometrical properties of the object, resulting in a highly accurate measurement offering precision to the micron range. This builds into a detailed virtual representation of the object for comparison against CAD and 3D models and provides measurement data for analysis.

Drawing on the company's extensive experience in the field of advanced ceramic material technology, Morgan's alumina materials offer high stiffness and are lightweight, inert, non-magnetic and stable during temperature fluctuations due to a low coefficient of thermal expansion.

Morgan's ceramic styluses also provide crash damage protection to high-value measuring systems. The alumina stylus is designed to break in the event of a program setting error. This is not true of a stainless steel stylus, which may continue to transfer stress to the part it is measuring, causing damage to the probe and the wider system or the valuable component being measured.

Over the course of the relationship, Morgan has continuously proven itself to be a valued supplier, in more ways than one. Not only has Morgan provided a high-quality critical solution to Renishaw, it has done so reliably and consistently, maintaining its 'A' grade supplier status over the last 20 years. Perhaps more impressive though has been Morgan's flexibility and willingness to meet Renishaw's ever-evolving requirements; it now produces thousands of parts per year for Renishaw, whose presence within the engineering sector continues to increase, and is set to grow further.

That the collaboration has lasted this length of time is testament to Morgan's ability to deliver first-class solutions which harness cutting-edge ceramic material technology. It also speaks volumes about the quality of the working relationship between the two businesses and Renishaw's loyalty to Morgan. To this day, Morgan continues to work closely with Renishaw's team of engineers, helping to develop future product lines that will drive improvements within the measurement process.

Oliver Ridd, International Sales & New Business Development Manager at Morgan Advanced Materials, commented: "The relationship between Morgan and Renishaw showcases the best in material science innovation. We work hard to understand our customers' requirements as this is what allows us to develop optimised, cost effective solutions which help overcome their most demanding and technical challenges."

Morgan Advanced Materials Signs Global Distribution Agreement with Level Peaks Associates

AUGUST 2016

Morgan Advanced Materials, a leading global manufacturer of specialist armour technology and soldier systems used by elite military and law enforcement applications, has finalised a reseller agreement with Level Peaks Associates, an internationally-renowned distributor of military equipment.

As part of the agreement, Level Peaks will be supplying products made by Morgan's Composites and Defence business to help satisfy the demands of the global military equipment market.

These will include selected items from Morgan's acclaimed LASA™ (Lightweight Armoured Soldier Architecture) range of soldier protection equipment, including ultra-lightweight scalable ballistic inserts.

Jim Clarke, Head of Solutions at Level Peaks, commented: "Morgan's LASA™ soldier protection range is synonymous

with class leading composite armour technology and innovation. By adding such an esteemed range of products to our portfolio, our mission to deliver the best in soldier protection systems where there is a demand can be realised."

Duncan Eldridge, President of Morgan's Composites and Defence business, added: "As an agency founded and staffed largely by army veterans, Level Peaks is without doubt one of the most trusted suppliers of military protection in the world. Their understanding of the challenges faced by military and law enforcement personnel places them in a strong position to promote our leading protection products to an international audience.

"We are proud to work in collaboration with such a prestigious partner, whose network of customers and credibility with the military and law enforcement communities will help consolidate Morgan's position within the global market."

Morgan Develops Unique Lightweight Plate to Combat the Threat of SS109 Ammunition

AUGUST 2016

Morgan Advanced Materials, a global leader in the application of advanced composite armour technology, has launched a pioneering, ultra-lightweight ballistic insert that provides multi-hit protection against NIJ Level III and special threats, including SS109 "Green Tip" ammunition.

The new 'LASA LWA III+ 109' ballistic insert is the latest addition to Morgan's extensive LASA™ range of combat equipment. Weighing just 1.6kg (3.5 lbs), and with a thickness of 21mm (0.8 inches), the LASA LWA III+ 109 ballistic insert has been developed to directly address the safety concerns of military, law enforcement and security personnel against the growing threat of the 'green tip' SS109 round.

The high-performing solution works in conjunction with approved NIJ Level IIIA soft armour. It delivers a lightweight alternative to the heavier NIJ Level IV plate, which typically weighs in excess of 2.5kg (5.5 lbs), as well as the standard NIJ Level III ballistic insert, which, critically, can be pierced by the SS109 round.

The durable LASA LWA III+ 109 ballistic insert, tested against NIJ 0101.06, meets stringent drop test requirements. It also delivers multi-hit protection at NIJ Level III and the special threats 7.62 x 51mm 149gr M80 FMJ, 7.62 x 39mm 123gr PS Ball (Mild Steel Core) and 5.56mm M193.

James Kempston, Business Development Director, Morgan

Advanced Materials – Composite & Defence Systems, comments: "Our extensive capabilities in composite armour design and manufacturing allows us to produce industry leading lightweight armour aimed at protecting law enforcement and military personnel.

"The LASA LWA III+ 109 represents a significant step-change in ballistic inserts. Not only does it protect against a complex range of threats, including SS109 ammunition, its lightweight design also significantly reduces weight burden, enabling more strategic load carriage for those working on the frontline."

The LASA LWA III+ 109 ballistic insert is the latest product in Morgan's LASA portfolio, delivering a complete range of protection from discreet covert solutions to protection against special threats exceeding NIJ Level IV.

LASA products are built to maximise safety, while minimising weight. This target is achieved through Morgan's use of cutting-edge materials, backed by the company's rigorous in-house testing strategies and expert knowledge of composite armour technology.

The LASA LWA III+ 109 is available to purchase through Morgan's Composites and Defence System business in the UK, Canada and Singapore.

Morgan Advanced Materials Launches Endless Rotating Axis for Automotive Industry

SEPTEMBER 2016



Morgan Advanced Materials, a global leader in the development and application of advanced material technologies, has launched a flexible rotary distributor to help customers in the automotive industry maximise efficiencies and reduce maintenance costs.

The latest innovation from Morgan's Electrical Carbon business, can be used in six axis robots, welding turntables and trunnions. The component allows for cumbersome cables to be replaced by a slip ring transmitter, which also comprises a full 360-degree rotating axis, with an unlimited angle manoeuvrability that eliminates defective drag chains. As a result, the unit can offer continuous rotation. As the system does not have to operate in reverse, this can deliver cost and time savings, while offering customers greater flexibility in terms of programming.

The slip ring can be utilised for continuous rotating transmission across a host of precision applications including welding, handling and gluing. Significantly, the system can operate 24 hours a day, for between five and eight years. Effectively eliminating the need for any costly downtime or recurring maintenance works, it delivers a full return on investment in as little as 12 months.

In contrast, a traditional cable carrier system has an average life-cycle of just 12 months. At any given time, the robot is limited to +310 degree turns in either direction. A traditional system is also constrained by ongoing maintenance costs as a result of trailing cables and potential subsequent damage to the robot.

The endless rotating robot axis from Morgan's Refoka® product offering provides a comprehensive solution as the system is capable of housing both data, media and electrical

currents, within a single compact interface.

Ingo Carnott, Key Account Manager – Automation, at Morgan comments: "In an on-demand environment, product optimisation and performance remain critical components of the global automotive industry. As a value-add partner to the sector, we have therefore invested heavily in developing new problem-solving tools. Critically, these solutions not only enable customers to meet engineering challenges, safely and efficiently, they also deliver wider commercial benefits as a result of their ability to boost overall productivity through improved operational effectiveness."

The advanced technology, which has a high current >200amp and 24V power supply, provides a range of flexible programming options which can help streamline data through a fast PROFINET certified Ethernet cable/connection, or for the transmission of video signals and media such as air, cooling water, primer or oil. Crucially, the components are all contained within a single robust housing unit, offering a level of protection in line with IP67.

The technology is also supported by a remote diagnostic facility. Customers can benefit from live data analysis across the whole PROFINET-certified system.

Thanks to the internal shielding and metal housing unit, the system is fully protected, ensuring full functionality in Electromagnetic compatibility-critical environments, particularly those where welding equipment is used.

Morgan offers a range of standard solutions to meet the varied automation demands of the automotive industry, and can offer custom-made solutions to meet specific customer requirements.

Morgan Improves Quality and Productivity with New Nilcra[®] Zirconia TS Grade Ceramic Die

SEPTEMBER 2016

Morgan Advanced Materials, a global leader in the development and application of advanced material technologies, has developed a new ceramic extrusion die, which enables engineers to significantly reduce costs and issues associated with poor die life, dimensional control, inferior surface finish, and high scrap rates.

Morgan has launched its Nilcra[®] Zirconia TS Grade, a high performance, hot extrusion die, that is manufactured using advanced ceramic materials specially designed for use within copper and brass extrusion. The solution offers a more efficient alternative to conventional metal-based dies, and is available as an insert only, or as a ready-to-use assembly shrink fitted within a steel retainer. An ultra-tough Mg-PSZ Zirconia, Nilcra[®] Zirconia TS Grade has been proven by Morgan to provide up to a 30 times lifetime increase when compared to alternative metal dies, which typically only last for 5-10 pushes.

This significantly reduces downtime costs caused when engineers have to stop the extrusion process and re-place a convention die. Additionally, due to the unique properties

of Nilcra[®] Zirconia, the ceramic die is not susceptible to creep at elevated temperatures enabling product size to be maintained throughout the life of the die.

Morgan's Research and Development team developed the Nilcra[®] Zirconia TS grade solution as an alternative die material with very low thermal conductivity, enabling reduced heat transfer from the extruded product to the die body and holder. The material also has superior hardness and wear resistance properties that maintain a high level of surface finish on extruded product.

Tim Hazlehurst, Senior Sales Engineer, at Morgan Advanced Materials commented: "We wanted to develop a material that not only helps our customer to eliminate production downtime associated with poor die life, but also reduces their overall process costs by providing superior product quality with reduced scrap rates. The Nilcra[®] Zirconia TS Grade meets these key objectives and, thanks to its unique material characteristics, will enable engineers to benefit from reduced downtime, increased process efficiency, and higher yields."

Morgan Advanced Materials Develops New Alumina Sensor to Withstand Extreme Temperatures

SEPTEMBER 2016

Morgan Advanced Materials, a world leader in sensor and measurement technology, has produced a new type of alumina sensor specially designed for high pressure and high temperature water and sub-metering.

The sensor has been specifically developed to withstand extreme temperatures, making it ideally suited to both heat metering and high temperature fluid metering. Manufactured using Morgan's specially-formulated proprietary alumina, the sensor solves many of the problems associated with high temperature environments, with a focus on reducing thermal drift and zero flow offset over a large temperature range.

Morgan's new sensor significantly minimises the flow offset because the material has been manufactured to control the thermal properties of both the internal and external structure. This enables the minimum flow rate range to be kept as small as possible, enhancing the overall accuracy of the reading.

Morgan's sensor design has been tested up to 100 bar pressure and 150°C which surpasses the current market requirements for heat metering. This is a direct benefit of using alumina in the sensor design, a material which

has minimal expansion properties, and is renowned for its strength and durability.

Due to its thermal stability, the sensor is also excellent for metering of potable water or other fluids. The inert nature of alumina makes a component that is suitable in food and pharmaceutical environments, as well as providing a long operational lifetime.

Morgan also has its own ceramic pressing and injection moulding capabilities, enabling complete vertical integration from start to finish of the housing and Lead Zirconate Titanate (PZT) elements of the sensor. These in house capabilities allow Morgan to provide a full design and development package.

Charlie Dowling of Morgan Advanced Materials commented: "Our new range of high temperature sensors has undergone extensive research and development to ensure that it is our strongest and most effective sensor for use in extreme temperature environments."

Available as part of a standard range, or bespoke to order, it promises to reduce environmental factors during metering."

Morgan Advanced Materials Quadruples Capacity for Industry Leading Co-Fired Actuator Product Line

SEPTEMBER 2016

Morgan Advanced Materials, a global leader in specially engineered materials, has quadrupled its capacity for the production of co-fired multilayer piezoelectric components (PCMA) as it prepares to take advantage of attractive projected market growth.

Morgan has upgraded its existing facilities allowing it to produce tens of thousands more PCMA components every month. In addition to enabling the business to achieve a higher output, the upgrade has also enabled Morgan to improve its accuracy of electrode registration to produce a higher quality of multilayer application. This adds to Morgan's existing capacity for precision dicing, sputtering, and automated optical inspection, all performed in a cleanroom environment.

The move means Morgan is well poised to take advantage of a piezoelectric industry set for growth between now and 2022, with significant demand for piezoelectric components stemming from industries including industrial control, communication, optics, and micro/nano processing. PCMA's are fast gaining traction in these sectors because their inherently capacitive nature means that they do not require any magnetic coils, therefore providing simple, compact solutions to actuation needs.

They are also free of electromagnetic interference, while offering high energy efficiency, allowing Morgan's engineers to offer customers an extended battery life for their products.

Morgan's proprietary composition has already demonstrated the capability to produce ultra-thin PCMA's, producing components as thin as 100 microns with aspect ratios as high as 1/100. These components open up the design space for

portable device designers to deploy low voltage piezoelectric actuation for ultrasonic motors, and haptic feedback solutions. Morgan's PCMA's also offer large displacements of the unibody piezoceramic component with low voltages, allowing customers to drive their actuation directly from batteries, without the need for boost circuits. This is particularly significant for in-field service deployment applications, where the application requires a portable or onsite solution.

The increasing use of robotics being deployed in harsh environments is also presenting opportunities for Morgan, as thermal stability begins to present a challenge for industrial control devices. Often, service temperatures can drive limitations in externally amplified benders, such as unimorphs and bimorphs, which lose stamina with increased temperatures, limiting the control assembly's rating for use.

To combat this, Morgan is producing co-fired variants, deployable to 200°C (392°F), reducing the effect of higher temperatures and much of the degradation that is typically associated with standard unimorphs and bimorphs.

Al Metcalfe, General Manager for Technical Ceramics at Morgan Advanced Materials commented: "Our improved PCMA line, which is housed in a class 10,000 cleanroom in our Bedford, OH facility, gives us the capability we need to take advantage of the fast growing PCMA market.

We have ensured that our PCMA line is capable of accommodating rapid tool changes, so we can make light work of complex designs and enable faster commercial penetration for our customers, across a wide range of sectors."

Morgan Advanced Materials Awarded £1.1m Ballistic Shields UK MoD Contract

SEPTEMBER 2016

The Composites and Defense Systems business of Morgan Advanced Materials, a global leader in composite armor technology for personnel and platforms, has secured a £1.1m contract from the Ministry of Defence (United Kingdom) to supply ballistic shields and supporting services.

The contract will see Morgan provide a range of bespoke ballistic shields drawing on Morgan's class-leading composite armor technology capability. With outstanding levels of multi-hit protection, the shields showcase the latest in lightweight armor, ensuring maximum mobility and protection for army personnel in the arena of combat.

Duncan Eldridge, President of Morgan's Composites and Defense business, also commented: "We are enormously proud to be supplying ultra-lightweight, bespoke ballistic shields to the Ministry of Defense.

Our cutting edge ballistic composite materials knowledge, coupled with rigorous in-house research, development and testing has allowed us to create ultra-lightweight ballistic shields, delivering outstanding levels of protection whilst enabling maximum maneuverability.

ABOUT MORGAN ADVANCED MATERIALS



Morgan Advanced Materials is a global engineering company offering world-leading competencies in materials science, specialist manufacturing and applications engineering.

We focus our resources on the delivery of products that help our customers to solve technically challenging Problems, enabling them to address global trends such as energy demand, advances in healthcare and environmental sustainability.

What differentiates us?

Advanced material science and processing capabilities. Extensive applications engineering experience. A strong history of innovation and reinvention. Consistent and reliable performance. A truly global footprint. We find and invest in the best people.

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