

# Innovate UK

**Results of Competition: Materials & Manufacturing Round 2 3-12 Months**  
**Competition Code: 1611\_MM\_R2**

**Total available funding is up to £5m for this stream (£15m total competition budget)**

**Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.**

<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
<b>Bryant Symons Technologies Limited</b>	Aircraft Window Advanced Refurbishment Machine (WARM)	£96,883	£67,818
<b>Project description - provided by applicants</b>			
<p>Bryant Symons Technologies Ltd is a micro-SME manufacturer of ultra-precision machinery and has a long history of machine tool development in the aviation industry. This project, Aircraft Window Advanced Refurbishment Machine (WARM), is a highly innovative solution to a long-standing problem in the aerospace industry. Prospective customer research, patent and market searches have unearthed competitors which use outdated and/or expensive methods but none are comparable to WARM in terms of cost effectiveness, productivity, projected reliability and environmental friendliness. The diamond machining technology developed in this project and applied within WARM is unique. A report on Acrylic Window Cracking by influential senior management at Lufthansa clearly states the benefits of diamond machining over the currently used abrasive processes. The market is ripe for a shake-up as airline operational running costs are under constant pressure whilst adhering to strict compliance standards and procedures. WARM will offer airlines and MRO customers many technical and operational advantages while delivering highly significant cost benefits and offer Bryant Symons a commercially desirable, scalable and exploitable new product/service.</p>			

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<b>London Forest Products Limited</b>	Carbon Additive Manufacture (CAM)	£98,813	£69,169
<b>Project description - provided by applicants</b>			
* Challenge - Ageing population and lifestyle factors incl obesity are contributing to a rise in hip replacements and revisions. UK annually spends Â£174m on 80k hip replacements (Nat Joint Registry, 2016). * Content and objectives - The project will establish a detailed material specification leading to innovative implant manufacture, matching the characteristics of human bone.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
A. M. Packaging Ltd	CARE - Cobot Amp RosE	£364,831	£127,691
Walkers Snack Foods Limited		£33,164	£0
Nottingham Trent University		£100,659	£100,659
<b>Project description - provided by applicants</b>			
<p>Retail chains require shorter lead times for custom multi-packaged products, driving the need for multiple packaging lines to run at higher speeds. AMP Rose has developed advanced but product specific high speed packaging lines to address this issue. The bespoke packing lines are designed and constructed by a skilled workforce which limits the productivity and output of the company. An alternative approach is to develop a standardised robot system based on cobots (collaborative robots that can work alongside humans) that is completely flexible and can work with humans on relatively rapidly changing multi-pack packaging lines. Each cobot with a dual-purpose vision system and can operate either individually or as a group. The cobot can identify its place on the line, select the appropriate gripper tools and begin work immediately. This innovation means that our customers can flexibly meet the needs of the market with the minimum capital cost. More importantly AMP Rose can develop a production line to manufacture and supply standardised cobot systems rather than supplying hand built one off packing lines. With standardisation and a production line it means their competitiveness and productivity will improve considerably enabling them to grow market share and profitability.</p>			

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<b>Autocraft Drivetrain Solutions Limited</b>	Radically Improved Cleaning of Engine Components for Remanufacturing	£97,926	£58,756
<b>Project description - provided by applicants</b>			
Autocraft is a privately owned company by its management team (MBO) and has been in business for over 40 years. We are Europe's leading engine remanufacturer employing 200 people with a turnover of Â£21M. Our remanufactured engines re-use up to 80% of the material from a failed engine so they are a green, sustainable alternative to buying a new engine. As part of our process, the very dirty engine components that we use from the broken engines have to be cleaned; this is currently a very expensive and inefficient process that has not changed for at least 20 years. This project is to create a more efficient and automated cleaning process that uses less chemicals yet delivers a cleaner product at a much lower cost. The lower the cost of the cleaning process the better as it reduces the cost of our remanufactured engines compared to our competitors throughout the world. We have current sales opportunities to increase our sales by up to Â£10M per annum, creating 60 additional jobs (mostly skilled) at our Grantham facility. We believe that this project can deliver the cost benefits needed to secure this additional business and reclaim valuable raw materials thus also delivering environmental benefits.			

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<b>Cadscan Limited</b>	3D Screen Printing	£60,922	£42,645
<b>Project description - provided by applicants</b>			
<p>The transition from manufacturing prototype plastic parts to production parts involves significant investment, particularly with injection moulding where high tooling and design costs require high-volume production to be economically viable. While additive manufacturing reduces design risk it is generally unsuitable for production due to limited materials, material performance and time-consuming post processing. Eliminating this transitional gap has the potential to transform the manufacture of low-volume products, accelerating time to market, reducing cost, and reducing risk, all factors critical to product success and barriers to entry. This proof-of-concept project will develop a new solution called 3D Screen Printing (3DSP), invented specifically for runs of 1 to 10,000 pieces. The 3DSP method has many of the benefits of the injection moulding state of the art, such as part resolution, fully homogeneous parts and high accuracy, without any tooling and vastly increased speed over other additive technologies. 3DPS has the potential to reduce prototype production time to minutes from hours, combining the design freedom of additive manufacturing with the part quality of injection moulding.</p>			

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<b>Adaptix Ltd</b>	Developing High Vacuum enclosures for novel X-ray source	£99,209	£44,644
<b>Project description - provided by applicants</b>			
<p>Many people you know will have had a Computed Tomography ('CT') scan as part of their medical treatment. These machines are miracles of engineering and have transformed clinical practice, with their use doubling over a decade. However, many of the people you know may have had to wait sometime to have their scan, due in part to the expense of such machines restricting availability in the UK. In addition, doctors have to balance their use with the risks resulting from the radiation associated with CT. Adaptix is developing a Flat Panel X-ray Source (FPS), an array of small low-power emitters, something that allows 3D imaging without movement, and which allows a low-cost, low-dose 3D imaging solution that could be taken to the bedside or deployed in Primary Care. Innovate UK will support Adaptix, a UK SME, in developing novel manufacturing processes to allow the low-temperature bonding of ceramics to aluminium to be used in the manufacture of their FPS. This will transform the cost of producing the source while allowing it to hold vacuum (and therefore operate) over a period of many years deployed within a hospital.</p>			

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<b>Green Fuels Research Ltd</b>	Feasibility Study of Biodiesel	£69,999	£48,999
University of St Andrews	Production at Heterogeneous Catalysts	£30,000	£30,000
<b>Project description - provided by applicants</b>			
In this project, we will be studying new catalyst systems for production of renewable transport fuels.			

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<b>L W Solutions Ltd</b>	Automated integrated micro machining, micro-manipulation and laser soldering system	£99,814	£69,870
<b>Project description - provided by applicants</b>			
<p>The technology and componentry included in the next generation of active medical devices is creating significant manufacturing challenges and opportunities. Complex devices need to be produced at ever smaller scale while still being designed for single use applications. The applicant manufactures and operates high performance laser machining systems for the precision processing of high tech cables/wires and has received market enquiries for very high precision (0.1mm pitch or finer) automated integrated micro machining, micro-manipulation and laser soldering systems. The target application would be to automate a currently manual, highly expensive, production of an arterial catheter. The applicant faces a number of manufacturing and materials related R&amp;D challenges that this project will resolve. The project will conclude with the development of very high resolution evaluation samples for evaluation by potential customers (medical device producers e.g. TE Medical). Outcomes: this project allows the applicant to respond to a market opportunity that is estimated to be worth Â£4.84 m over 5 years ensuring the applicant's process/equipment is an industry standard approach for the production of precision parts, connections and assemblies.</p>			

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<b>SunScape Systems Limited</b>	CArapace Slate Modular rOofing System (CASMOS)	£133,200	£76,116
Swansea University		£57,081	£57,081
<b>Project description - provided by applicants</b>			
<p>Welsh slate, and Natural slate, is a highly desirable and premium product in domestic housing markets across the world. Installed well, by a skilled craftsman it is a beautiful addition to almost any house. However, resource and skills shortages across the globe have led to challenges in its ongoing use in the house building and renovation markets. Carapace is a new and innovative roofing solution that utilises waste slate material from local sources to produce a modular, composite roofing tile that can be installed in a fraction of the time of a tradition slate tile. Our innovation uses a unique interlocking system that allows the user to simply clip the tiles together to form a safe and secure slate roof installation. Our system will reduce the time taken to install a slate tile roof by up to 90%; we have demonstrated that installation of 1sqm of Carapace is possible in just 1 minute. This project will develop a SMaRT and future proof manufacturing process to produce the Carapace roofing system on a commercial scale, enabling our innovative product to become publically available on a large scale for the first time.</p>			

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LIG Nanowise Ltd	High power laser system for the manufacture of ultra-thin sapphire wafers	£57,090	£39,963
<b>Project description - provided by applicants</b>			
Synthetic sapphire is the hardest of all known oxide crystals; second in hardness only to diamond. The extraordinary durability of sapphire makes it an ideal material for consumer electronic devices that use digital output displays (e.g. smartphones and tablet computers), however its use as an ultra-thin wafer within the consumer electronic section has yet to be fully realised because of the technical issues encountered when processing the material at scale. LIG Nanowise propose a new method to manufacture ultra-thin sapphire wafers.			

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<b>West of England Textiles Company Ltd</b>	Developing a novel process to improve quality & competitiveness of British woollen cloth (S2S)	£99,849	£69,894
<b>Project description - provided by applicants</b>			
<p>The project aims to develop an innovative manufacturing system that produces a step change in the quality of woollen textile manufactured from British wool enabling it to be incorporated into a number of sectors (apparel, home and automotive furnishings) for export as high value products to Japan, US and China. The British luxury industries is a growing market with around 78% destined for overseas market. The project will diversify existing British wool cloth that are of coarser quality than cloth manufactured from state of the art imported higher cost Australian wool enabling it to be used for the new high end export market. Our principle innovation lies in the application of existing laser and vacuum steam technologies into the textile sector to improve the softness of the wool fibre and reduce its diameter to enable cloth which matches the quality of imported wool. The project will result in an increase in West of England's manufacturing productivity and a step change in our competitiveness as we will manufacture higher value British textiles with increased export potential.. The project will also see financial benefits to the whole UK supply chain which are mainly SMEs from farmers, wool processors, weavers, cloth finishers and cloth converters who turn the cloths into a range of products.</p>			

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MCT Group Ltd	Flexible Restoration for	£70,000	£42,000
University of Brighton	Remanufacture of Rolling Stock Components	£29,968	£29,968
<b>Project description - provided by applicants</b>			
<p>Increasingly stringent environmental regulations such as WEEE and End-of-Life (EoL) Vehicle Directive require the reuse of waste. Remanufacturing adds value to waste streams by returning EoL items to working order rather than reducing them to their raw material value only, preserves more than 80% of the material and energy used to manufacture a new product [PEARL, 2010], thus is considered as an important element of the circular economy. Restoration, which returns defective parts back to service life is a critical operation of remanufacturing and could account for up to 50% of total remanufacturing cost. Currently restoration is still ad-hoc. Focusing on one-off production resulting from the differential quality of returned defective products, this feasibility study aims to assess and validate a new flexible restoration for the remanufacture of rolling stock components. This would address one of the major barriers hindering the uptake of remanufacturing which is the inability to remanufacture at a cost similar to that of mass production. The results of the study could lead to significant improvement in efficiency, thus promoting the expansion of the remanufacturing industry.</p>			

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PV3 Technologies Ltd	ROLLEM	£99,869	£69,908
<b>Project description - provided by applicants</b>			
The aim of this project is to advance the processes for the application of advanced coating technologies currently provided by PV3 Technologies. It will focus on development of a novel semi-automated prototype to provide highly homogeneous coatings with controlled, but variable, loadings, whilst surviving exposure to the range of chemicals used in our coating processes. This developed system will significantly increase the capacity and productivity of PV3 Technologies, providing the ability to keep up with the rapid growth in the sectors we currently supply and allow expansion into other areas.			

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<b>PRA World Ltd</b>	Enhanced thermal insulation performance polymer foam	£94,228	£65,960
<b>Project description - provided by applicants</b>			
Our concept concerns the development of an innovative high performance thermal insulation material that offers thermal conductivity and density approaching that of aerogels but at a cost that competes with PU and EPS foams. Polymer foam insulation such as polyurethane and expanded polystyrene (e.g. Styrofoam) is made by expanding the polymer with a blowing agent to produce a foam with relatively large cells that contain the low conductivity gas blowing agent. As the gas migrates out of the cells over time, the foam ages and the insulation performance falls. We will develop a polymer foam by a templating method to manufacture an insulation material with careful control of porosity and cell size distribution whilst eliminating the use of blowing agents; low thermal conductivity is achieved by high porosity and small cell size only. Proving the concept of the technology for enhanced thermal insulation manufacture will lead to a breakthrough innovation in the cost-effective and competitive production of high performance, blowing agent-free polymer foam thermal insulation material that can be used in a number of sectors where enhanced, reliable, low-cost thermal insulation is required, including refrigerated transport, construction, and hot water storage.			

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Tamicare Ltd	Development of a new, stronger, 3D printed, all direction-stretchable, cloth-like polymer fabric	£99,334	£69,334
<b>Project description - provided by applicants</b>			
<p>We wish to develop the next generation of our POC non-woven, all-direction stretchable, polymer cloth fabric, significantly increasing its strength and robustness to bring to the market. The research is driven by latent demand from global brands in activewear market where there is growing demand for unique non-woven meshes, fabrics and designs not possible through traditional manufacturing techniques. Current leading 3D printed fabrics, including our own, are forced to compromise between the drape and flexibility of the polymer fabric and the weight, thickness and strength of it. In order to meet the demands of the activewear market, we aim to develop a new non-woven polymer fabric, utilising our Cosyflex technology with new polymer compounds to create a fabric 15x stronger than current technology. This will be supported by the development of a multi-directional electrostatic flocking technology, enabling different thicknesses, strength and polymers to be applied to different parts of a garment. The development of the technology will immediately open up the activewear and footwear markets to us - we expect to generate £1.5m t/o Y1 -&gt; £9m t/o by Y5, 70% of which is exports, enabling us to become a world leader in the 3D printed textile market.</p>			

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<b>LSN Diffusion Limited</b>	Development Improvements in atomising nickel, cobalt & Iron based alloys for use in AM	£99,971	£59,983
<b>Project description - provided by applicants</b>			
Responding to quality and commercial demands from users of Additive Manufacturing (AM) worldwide, LSN will build on feasibility trials to reduce manufacturing costs per kg and improve powder morphology and cleanliness. The project will focus on nickel super alloys in rapidly growing demand in the aerospace and automotive, cobalt and iron based alloys used in dental, medical and other applications. It will build on computer modelling of the atomisation process carried out in collaboration with Swansea University.			

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<b>Aston Particle Technologies Ltd</b>	Enhancing Drug Solubility Using Novel Dry Powder Coating Technology	£99,950	£69,965
<b>Project description - provided by applicants</b>			
There is a lack of available technologies for particle surface modification that do not affect the particles physical and chemical properties. Currently 70% of new drugs being developed exhibit poor solubility and this provides a huge challenge and high cost for drug development in the pharmaceutical market. Current techniques are expensive, produce low yield and cannot process unstable drugs. Aston Particle Technologies Ltd. "APT" offers a novel one-step particle engineering technology that processes drugs and materials without the use of solvents and heat. Its USP lies in delivering enhanced particle properties for challenging drugs (high dose, moisture sensitive or heat sensitive) at low cost. APTs solubility enhancement project aims to increase the solubility of poorly soluble drugs, including those that are unstable, through its particle layering technology.			

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Craftsman Tools Limited	Intelligent tool-holding for metal-cutting machine tools	£69,993	£48,995
University of Huddersfield		£29,484	£29,484
<b>Project description - provided by applicants</b>			
Craftsman Tools Ltd is a multi-award winning UK precision engineering company specialising in innovative solutions for tool-holding, work-holding and supply chain management services and solutions. They seek to create new intelligent tool-holding incorporating 'internet of things' (IoT) sensing technology that, in conjunction with dynamic models, enables prediction of surface finish during machining. Allowing the widespread take-up of new innovations from the tooling suppliers, this system will improve the productivity of the end-users of the new technology and maintain Craftsman at the forefront of global tool-holding solutions.			

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Limitstate Limited	Rapid simulation of metal cutting	£69,761	£48,833
University of Sheffield		£29,620	£29,620
<b>Project description - provided by applicants</b>			
<p>Metal cutting is used in all metal machining processes (turning, milling and boring), widely used in the global manufacturing industry. However, reliably modelling the underlying physics of metal cutting has proved difficult, severely hampering efforts to design more efficient manufacturing processes. Thus at present, collected experience and/or time consuming and costly trial and error testing is still commonly used. The metal machining industry is estimated to be worth in excess of \$830 billion per annum worldwide, so there is huge scope for significant cost savings. In this project metal cutting will be modelled using an inherently discontinuous modelling approach, using the recently developed discontinuity layout optimization (DLO) numerical modelling technique, which is approx. 1000x faster than current-generation finite element based techniques. In the project uncertainties in the metal cutting process will be modelled and the method extended to model oblique cutting scenarios, allowing processes such as turning and milling to be modelled. This will give manufacturers the ability to rapidly determine optimum operating conditions, leading to significant improvements in productivity.</p>			

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<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
<b>Aurora Medical Ltd</b>	BondDebond	£59,890	£41,923
Permabond Engineering Adhesives Ltd		£25,142	£17,599
<b>Project description - provided by applicants</b>			
<p>The BondDBond project aims at developing new adhesive materials that can be broken on demand. This has applications in orthopaedic instrument design, facilitating new designs with potential cost savings benefits, but also in aerospace applications, where these materials can offer significant weight and maintenance costs reduction. In plastic packaging recycling, they would represent a step change in recyclability, in particular layered food packaging (e.g crisps packaging), where recycling is restricted by the adhesive between layers which cannot be removed. In order to achieve the on-demand bond, new smart adhesive materials need to be developed as well as a method of breaking the bond on demand. To achieve this, the project brings together adhesive experts Permabond Ltd with interest in developing such adhesive materials for aerospace and packaging applications, with mechanical engineering experts Aurora Medical Ltd who will look at implementing the new technology in orthopaedics as well as other applications. If this type of materials can be developed by this local UK partnership, they would be unique in the world.</p>			

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# Innovate UK

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**Competition Code: 1611\_MM\_R2**

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<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
Agemaspark Ltd	Production of mould tools with conformal cooling and coatings increasing mould efficiency	£99,958	£69,971
<b>Project description - provided by applicants</b>			
<p>The potential growth of the plastics caps and closures industry is being hampered by the tooling industry's use of conventional material removal machining process is for the production of the mould tools. These processes include milling, turning and drilling and they are inherently wasteful of material. The mould tools are machined from solid stock often cutting away up to 80% or more of the original material. Agemaspark seeks to overcome these barriers by developing a highly efficient advanced manufacturing process for the production of laser sintered mould tools with a novel ceramic coating. The mould tools will make use of breakthrough process utilising mould profile following conformal cooling channels embedded with temperature control sensors enabling localised temperature control. This will overcome inherent deficiencies in the current plastic caps and closures mould tooling technology. Our manufacturing process will enable us to produce the first laser sintered mould tool with real time temperature control for the plastic caps and closures industry in Europe and globally</p>			

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<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
<b>Unitive Design and Analysis Ltd</b>	On-demand manufacture of fibre-optic imaging arrays (project Sinope)	£99,880	£69,916
<b>Project description - provided by applicants</b>			
Healthcare, Life Sciences, Aerospace and Automotive sectors have an increasing need for the next generation set of solutions for imaging technology. Today, applications are built on systems which are complex, using cameras with multiple lenses, mirrors and projectors, planar fibre optic faceplates or tapers put together in a way to enable the capture, focus, block or guide of light to produce images. These solutions are complex, expensive, susceptible to vibration, and ineffective in ambient light. UDA are developing the next generation in image transfer devices to meet the needs of business. The project is the first of it's kind in delivering a new set of solutions for imaging, sensing and monitoring using digital user input to produce designed-for-function products that are light, affordable, high precision, and manufactured in the UK.			

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<b>Spiro Control Ltd</b>	Cooperative distributed model predictive control	£98,860	£69,202
<b>Project description - provided by applicants</b>			
We intend to develop and then embed within a control device, the code for a new process control strategy. Manufacturing plants typically consist of linked unit operations that are connected through a network of material, energy, and information streams. Because the unit operations are interlinked, it creates the potential for savings through material recycle, energy integration and overall feed or yield optimisation. However, because subsystems are often controlled independently, the potential efficiency gains are lost. Our innovation will enable us to capture these efficiency gains; with our solution, each sub-system will have a separate controller, which enables us to preserve simplicity, but each controller will be aware of network interactions between subsystems and will cooperate with other controllers in the network to ensure that a plant-wide objective is achieved. This new technology, which will require solving a number of technical challenges to create, will be applicable to a range of manufacturing plants that employ continuous processes including; the chemical, food processing, and pulp & paper industries. If successful, the benefits delivered to clients include improvements in productivity, reductions in energy consumption and improvements in product quality.			

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<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
<b>Great British Sports Cars LTD</b>	Flexible Cost Effective Processing of Composite Materials (FlexiComp)	£84,535	£59,174
SHD Composite Materials Ltd		£22,001	£15,400
<b>Project description - provided by applicants</b>			
FlexiComp proposes to research the technical and commercial feasibility of a flexible, rapid and cost effective composite processing technology for a multitude of different applications from transport to medical and everything in between. The ultimate aim is to produce a high quality composite part from a range of prepreg composite materials within a thirty minute cycle time without using an autoclave or expensive tooling. FlexiComp proposes to provide a significant reduction in processing cost and capital cost to enable carbon fibre (and other prepreps) to be cost effectively commercialised in numerous low volume (and potentially high volume) applications.			

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<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
<b>Void Technologies Limited</b>	VO+: Novel Manufacturing Porcess for Reducing Material Used in PE Film	£99,939	£69,957
<b>Project description - provided by applicants</b>			
Polyethylene (PE) is the most common polymer film, used widely in packaging and non-packaging applications to provide unmatched benefits in terms of design flexibility, strength and cost. The PE film industry is focussing on achieving material reduction & light-weighting to reduce the environmental impact of its products. Several relevant technologies are available; however all have limitations that prevent widespread adoption (high cost, inadequate mechanical properties, and incompatibility with thin films). VOID Technologies Limited (VOID) proposes to advance its nano-cellular light-weighting technology (branded VO+) in PE film from TRL3 to TRL5, to deliver competitiveness and growth in the manufacturing and materials sectors by: (1) Developing materials for targeted performance specifications including applications that require light-weighting, high strength and toughness, and moisture control. (2) Significantly reducing raw material used in PE film production leading to a cost reduction compared to standard PE film, whilst maintaining strength. The project will result in significant growth for VOID giving increased employment, substantial ROI and a platform technology which can be developed further for additional markets.			

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<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
Adjacency Group Ltd	Comingled Carbon Fibre - Readiness for Market	£54,600	£38,220
NCC Operations Ltd		£24,637	£24,637
J. & P. Coats, Limited		£3,220	£0
<b>Project description - provided by applicants</b>			
Advanced carbon fibre composite materials score well on performance, strength, and weight; but high cost and manufacturing complexity limits its broader market adoption. Comingled Carbon Fibre is an innovative material which may offer the potential for lower-cost, higher volume composites manufacture. Our project will advance the manufacturing readiness of Comingled Carbon Fibre (CFF) technology in the UK. Through this innovation in Carbon Fibre Materials & Manufacturing, we aim to increase manufacturing output, productivity and value capture in the UK.			

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<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
<b>Bizgraph Ltd</b>	Manufacturing MIND (Mastering Industrial Network Dynamics)	£96,208	£67,346
<b>Project description - provided by applicants</b>			
The Manufacturing - Mastering Industrial Network Dynamics (Manufacturing MIND) project will design and implement business resource networks with entities for dynamic manufacturing sector applications. The design will include resource property sets that link material characteristics to manufacturing efficiency and product performance. The resulting well characterised business networks will facilitate dynamic configuration and updating of multiple supply chains within or across manufacturing enterprises. The Manufacturing MIND project will extend the capability of Bizgraph's existing Business Resource Framework (BRF) and will be implemented in bizGraph computer applications using graph database and graph-based visualisation technologies. Hence, this project will enable Bizgraph Ltd to provide manufacturing companies and other enterprises with a business application to support rapid and efficient progress from an idea to customer products in any or all market sectors.			

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Acedag Ltd	Dissolva	£99,607	£69,725
<b>Project description - provided by applicants</b>			
<p>Tampons, pads and panty liners generate 200,000+ tonnes of landfill waste/year in the UK, and contain 90% plastic, which doesn't degrade. There is an growing demand from women to source environmentally friendly alternatives for their personal needs, and some green products have started to enter the market. Similar disposal problems exist with ostomy bags, incontinence pants, food packaging and medical dressings. To address this need for greener alternatives which remain affordable for consumers, we will develop a novel process which can deliver a composite material that can be manufactured into a range of water soluble biodegradable flushable products. Our novel process is to manufacture a biodegradable water soluble film material, where over 60% of the composite film is water soluble. The material does not degrade immediately upon contact with liquid to itâ€™s outer surface, so can be used safely and then disposed of and only when submerged will the materials seperate allowing the greater water soluble element access to water and readily dissolving. Other sectors where the material could be utilised with or without the absorbent layer include ostomy pouches, food packaging and medical dressings. The ROI is 992% assuming a total cost to market of Â£250k.</p>			

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<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
<b>Darlow Lloyd &amp; Sons Limited</b>	Recovering precious and heavy metals from industry by-products and legacy stockpiles	£610,051	£213,518
TATA Steel UK Limited		£116,475	£29,119
<b>Project description - provided by applicants</b>			
Globally there are millions of tonnes of ferrous bearing materials in unrecovered legacy stockpiles. These stockpiles may leach heavy metals which have to be controlled from an environmental viewpoint. Many Industrial Manufacturers have left these stockpiles build due to the cost of their disposal. This project aims to reprocess these stockpiles allowing extraction of the valuable metals such as zinc and produce a usable Iron Ore substitute. In other industries similar scenarios exist, where the stockpiling of problematic materials has been accepted as an alternative to costly waste disposal techniques. This project aims to release the inherent value contained within the waste providing commercial value to the business as well as addressing a serious environmental concern.			

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<b>Fibre Extrusion Technology Limited</b>	Meltblown Process Step Change	£100,000	£70,000
<b>Project description - provided by applicants</b>			
Users of meltblown processes tell us that they are seeking improvements in the capability of such processes when dealing with advanced polymers with high melt viscosity. We now see an opportunity to address their concerns and to potentially deliver mutual benefits to both Fibre Extrusion Technology FET and its customers. We wish to carry out Industrial Research to create the data and know how to break through the technological barrier to progress in a Project at a cost of 100,000 and have in house the necessary expertise to succeed in such a project, but need financial assistance to avoid cash flow limitations and complete the work within a 12 month time frame. The developed know how will allow us to demonstrate our capability to achieve performance leaps to users to help them to differentiate their product ranges and for FET to achieve sales by providing technology and custom built equipment.			

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<b>Smart Surgical Appliances Limited</b>	High Efficiency Light-guide with Integrated Conditioning Optics (HELICO)	£76,449	£53,514
<b>Project description - provided by applicants</b>			
<p>Key-hole surgery is an advancing field that seeks to reduce trauma associated with surgical procedures, by delivering devices that fit through tiny incisions. Highly complex procedures can be carried out inside confined body cavities, obtaining the best possible view and navigating the surgical field is a key challenge. Smart Surgical (SS) has developed a visualisation product to facilitate navigation in key-hole surgery. Part of this platform is a disposable needle light guide "LG", with an integrated lens, that distributes light and illuminates the body cavity. However, a core challenge is scaling the current LG with respect to manufacturing and material composition. The applicant is limited by currently available production &amp; material processes. At one extreme are very low cost methods to produce plastic LGs (used for consumer products) and at the other extreme are "high-end" glass LGs that have excellent optical performance but are very costly. Equally, both provide no integrated lens to control/condition the distribution of light output. The applicant wishes to broaden the field to develop a middle ground, a high optically efficient polymer LG at very low unit cost with integrated conditioning optics. The LG will aid key-hole surgery, associated medical sectors, and wider industrial applications.</p>			

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Big Barn C.I.C.	Raising food & drink sector manufacturing productivity using flexible resources (REACT)	£28,984	£28,984
Homeodynamic Autonomy Limited	Raising food & drink sector manufacturing productivity using flexible resources (REACT)	£66,936	£46,855
<b>Project description - provided by applicants</b>			
<p>UK Food &amp; Drink (F&amp;D) manufacturing sector productivity levels need to be radically improved if they are not to make the sector fall behind international competition and place the UK F&amp;D sector competitiveness &amp; growth under threat. This low productivity is caused by high levels of product demand variability the effects of which are to reduce manufacturing effectiveness. The REACT technology aims to provide controls for managing flexible responses that counteract the effects of variability. In this respect REACT provides novel digital approaches to manufacturing productivity improvement that uses data modelling &amp; analysis, and automated decision-making. Here, the REACT approach involves innovative use of models to measure the effects of variability and automated decision-making that uses these quantified effects to determine appropriate flexible responses. REACT also enables flexible resource responses to be made available at the right time, over the right period, in the right place, and of the right type and level. REACT provides flexible responses to variability that maintains the high productivity levels, low costs &amp; high throughput rates, required to grow the UK F&amp;D sector. When exploiting REACT its application to other manufacturing sectors, in &amp; out the UK, will be pursued.</p>			

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