NATEP

# Manufacturing Process Projects










Manufacturing Process Projects

| Project | Supply chain partnership | Contact |
|---|---|---|
| **C-MET Composite Metal Engine Technology** | • Aerospace Metal Composites Ltd<br>• Cosworth Ltd<br>• Rolls-Royce plc<br>• BRP-Rotax | Dr Stuart Godfrey<br>Business Development Manager<br><br>stuart.godfrey@materion.com |
| The C-MET project will develop the use of metal matrix composites for aero-engine applications, lighter weight designs will enable lower costs and significant reductions in aero-engine emissions.<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Novel disruptive composite structures** | • Adhesion Technologies Ltd<br>• Loop Technology Ltd<br>• Leonardo MW Ltd | Douglas Wood<br>Commercial Director<br><br>douglas.wood@adhesiontec.com |
| Adhesion Technologies is developing the next generation composite fixing technology 'Attenuator' to be demonstrated in Leonardo MW's revolutionary Rotary Wing Unmanned Aerial System..<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **CTES - Lower Cost, Higher Performance Composite Tooling** | • Composite Tooling & Engineering Solutions Ltd<br>• SHD Composite Materials Ltd<br>• Applied Graphene Materials Ltd<br>• GKN Aerospace | Liam Moloney<br>Director<br><br>liam@ctesltd.co.uk |
| To develop a lower cost, higher performance, composite tooling solution suitable for use in the production of all types of composite aerospace structures.<br>NATEP Grant £147,225 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Advanced Stress Concentration Assessment Tool (ASCAT)** | • Cabot Design Ltd<br>• Gingerneering Ltd<br>• Safran Landing Systems | Rachel Stephenson<br>General Manager<br><br>rachel.stephenson@cabotdesign.com |
| Generation of an analysis tool which integrates into current commercial available analysis software to assess the peak stresses at stress concentrations in landing gear structures.<br>NATEP Grant £90,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Cabin Interior Monument Load Cell** | • Cabot Design Ltd<br>• Gingerneering Ltd<br>• Rockwell Collins operating in the UK as B/E Aerospace (UK) Limited | Rachel Stephenson<br>General Manager<br><br>rachel.stephenson@cabotdesign.com |
| A novel load cell developed for testing aircraft interior structures. With enhanced stiffness representation, self-calibration and interchangeable interface adapters, the load cell advances the useful data obtained during test and enhances capability for correlation with analysis<br>NATEP Grant £62,500 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Standardised Image Correlation for Industry** | • Enabling Process Technologies Ltd<br>• Strain Solutions Ltd<br>• Airbus | Dr John Philip Tyler<br>Director<br><br>philip.tyler@eptworld.com |
| The project will develop a new physical method for validating digital image correlation displacement/strain data by achieving traceability to the length standard at the time of test data capture.<br>NATEP Grant £58,142 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **BASELINE - Rapid Machine Tool Verification** | • Insphere Ltd<br>• Hexagon Manufacturing Intelligence (UK) Ltd<br>• Nuclear Advanced Manufacturing Research Centre<br>• Rolls-Royce plc | Ben Adeline<br>Chief Executive<br><br>ben@inspheretld.com |
| The Baseline project will develop a solution for rapid verification of large volume machine tools. The outcome of this will be to improve machining processes, reducing scrap and improving machine uptime.<br>NATEP Grant £107,790 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Fit and Forget Cable Harnesses** | • Scientific Management International Ltd<br>• Concept Cables Ltd<br>• Safran Landing Systems | Glen Richardson<br>Chief Technical Officer<br><br>glen.richardson@smi.group |
| Fit and forget design solution to avoid any water or moisture ingress into aircraft landing gear connector harnesses.<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Advanced Magnesium Investment Casting (AMIC)** | • Aeromet International Ltd<br>• Luxfer MEL Technologies<br>• Spirit Aero Systems | Paul Monington<br>Head of New Technology<br><br>paul.monington@aeromet.co.uk |
| The development of investment casting technology to enable the casting of near net shape magnesium castings. The project utilises additive manufacturing techniques in pattern production to reduce lead time and production costs, while addressing reported casting difficulties with innovative ceramic shell solutions.<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **A20X Surface Treatments Development** | • Aeromet<br>• Poeton Industries<br>• Boeing (customer) | Mike Bond - Director of Advanced Material Technology<br>mike.bond@aeromet.co.uk |
| The project will develop and verify the performance on a range of metal finishing treatments (anodic and chemical conversion coatings) for Aeromets A20X family of casting alloys without using hexavalent chrome compounds (which have a limited life under REACH legislation).<br>NATEP grant £35,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Process Optimisation for Aerospace Alloys** | • ANT Industries<br>• Arrowsmith Engineering<br>• Technoset<br>• Pattonair Ltd (customer)<br>• ITP SA (Spain) (customer) | Mark Harriott – Technical Manager<br>mark.harriott@antindustries.com |
| The project will:<br>improve manufacturing processes on exotic metals that will substantially increase capacity in the Aerospace supply chain.<br>Utilise the expertise of the Manufacturing Technology Centre, Coventry, to undertake research into specific machining processes.<br>Optimise production methods for machined aerospace parts to secure UK supply chain competitiveness and reputation for providing a world class service.<br>NATEP grant £90,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Wet Fit Slave Fasteners** | • Kwikbolt Ltd<br>• i2M<br>• Wesco Aircrafts (customer)<br>• GKN Aerospace (customer)<br>• Lockheed Martin Aeronautics (customer) | Mr Jan Niklewicz – Technical Director<br>jan@kwikbolt.com |
| The project will design and develop, in collaboration, new innovative wet fit slave fasteners to be used during composite aircraft assembly. Providing a more efficient and effective working environment as well as a more cost effective, environmentally friendly and reliable method of production.<br>NATEP grant £145,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Precision Deep Hole Boring** | • Perfect Bore Manufacturing Ltd<br>• Dickinson Legg Ltd<br>• Gemms Ltd<br>• Impcross Ltd (customer) | Jon Waghorn – Project Manager<br>jon.waghorn@pbm-ltd.com |
| PBML and DLL are collaborating to produce more accurate, robust and enhanced geometric tolerance bore solutions to the aerospace industry<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Water Soluble Ceramics for Aluminium investment casting applications** | • Aeromet Intl. Ltd<br>• Adaptive Engineering Solutions<br>• Airbus (customer) | Mike Bond - Director of Advanced Material Technology<br>mike.bond@aeromet.co.uk |
| The project will develop a water soluble ceramic material which offers significant improvement potential in the investment casting industry. Once mature, this technology will allow components to be manufactured with features which today cannot be produced, thus opening up the product design space for parts count and component size reduction.<br>NATEP Grant £148,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Thermoplastic Composite Fusion Welding (CoFusion)** | • AGC AeroComposites<br>• The National Composites Centre<br>• Ten Cate Advanced Composites Ltd<br>• Rolls-Royce plc (customer) | David Conway - Materials Technology Director<br>dave.conway@agcaerocomposites.com |
| The CoFusion project builds on previous development work to optimise the efficiency and applicability of an innovative, rapid, low cost and flexible thermoplastic composite welding process to aerospace standards.<br>NATEP Grant £137,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **SMART Racking System** | • S2 Aerospace Ltd<br>• University of the West of England<br>• Airbus Military UK (customer) | Tim Shortman - Managing Director<br>tim.shortman@s2aerospace.com |
| The funding supports the development of a SMART Racking System for high-value aircraft wheels in the aerospace MRO and the introduction of new development capability within S2 (currently "build-to-print") for innovative engineering design solutions.<br>NATEP Grant £154,750 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Xenon Pulse Technology in Fibre Placement** | • Heraeus Noblelight Ltd<br>• Hexcel Composites Ltd<br>• Rolls-Royce plc (customer) | Martin Brown - Applications Manager<br>martin.brown@heraeus.com |
| Heraeus Noblelight Xenon Flash technology offers potential cost and performance advantages in processing of composite materials for aerospace applications. This research will take the technology closer to commercialisation.<br>NATEP Grant £145,500 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Lightweight Pipe End-Fittings** | • Sigma Precision Components UK Ltd<br>• 3T RPD Ltd<br>• Customer | Mike Andreae - Director of Technology and Improvement<br>michael.andreae@sigmacomponents.co.uk |
| The Lightweight Pipe End-Fittings project will design rigid pipe end-fittings for minimum mass, suitable for additive manufacture technology and test them in accordance with aero engine operating conditions.<br>NATEP Grant £143,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Flight Guardian** | • The Great Circle Ltd<br>• University of Central Lancashire<br>• McLaren Applied Technologies (customer) | Adam Berrington – Director<br>adam@thegreatcircle.co.uk |
| Flight Guardian is a first of a generation disruptive cockpit technology to improve the safety of aircraft. It uses body worn sensors and computing devices to act, in many respects, as a virtual co-pilot, providing a pilot with an extra pair of eyes to monitor the aircraft instruments, spotting and even predicting problems before they occur. It will produce warnings for the pilot and offer advice on a course of mitigating action to take to prevent accidents.<br>NATEP Grant £126,800 | | |

| Project | Supply chain partnership | Contact |
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| **Volume manufacture of a composite fixing and weight Reduction system** | • Adhesion Technologies<br>• MEP Ltd<br>• Dopag<br>• Formax<br>• Pressavon<br>• Loop Technologies<br>• GKN (customer) | Colin Wood – General Manager<br>colin.wood@adhesiontec.com |
| This project provides a machine to prove mass production of Fiba Spida fixings which will facilitate weight reduction and revolutionise how composite aerospace structures are designed, and constructed.<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **TOGGLON a bonded Fixings Installation System** | • Adhesion Technologies<br>• MEP Ltd<br>• Pressavon<br>• Loop Technologies<br>• GKN (customer) | Colin Wood – General Manager<br>colin.wood@adhesiontec.com |
| The Togglon project enables us to deliver the world's first installation tool specifically designed to quickly, accurately and consistently install composite bonded fastenings on to most substrates at any angle.<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Aerospacespecialprocesses.com** | • Valuechain.com Ltd<br>• Stainless Plating Ltd<br>• Blackprint Ltd t/a "Alloy Heat Treatments"<br>• Bombardier (customer) | Tom Dawes – Director<br>tdawes@Valuechain.com |
| Aerospacespecialprocesses.com is a cloud-based platform which aims to develop a collaborative on-line platform that streamlines communication between aerospace manufacturers and special process houses by optimising complex planning variables, sharing 2-way information with customers and co-operative partners and consolidated logistics planner providing intuitive decision support to improve service levels, productivity and therefore increase the competitiveness of aerospace special process houses.<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Collaborative Knowledge Management for Aerospace Operations Improvement** | • Agile Business Improvement Ltd<br>• Pentangle Internet Ltd<br>• Gardner Group Ltd (customer)<br>• Unilathe (customer)<br>• Packaging Automation(customer)<br>• Clwyd Compounders (customer) | Helen Jackson<br>hjackson@dna-agile.com |
| The development and deployment of persuasive technology (captology) to drive behavioural and cultural change supported by an innovative cloud-based collaborative problem solving platform to support UK aerospace supply chain companies disseminate best practice and embed standardised continuous improvement solutions. This is further supported by utilising semantic search capability and access to a shared collaborative knowledge repository with the aid of industry experts.<br>NATEP Grant £ 150,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Rapid Development Compressor Component Manufacture** | • Centrax Turbine Components<br>• Mettis Aerospace<br>• West Country Tools (WCT)<br>• Rolls Royce plc (customer) | Josh Sansom<br>Josh.sansom@centraxtcl.com |
| Providing a full commodity manufacturing solution to the production of HPC components to meet cost, quality and delivery targets in a flexible design sphere<br>NATEP Grant £149,340 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Additive Aero Valve Optimisations (AAVO)** | • Meggitt Aerospace Ltd<br>• Ashton & Moore Ltd<br>• GE Aviation (customer) | Scott Lathrope –Meggitt PLC Engineer<br>Scott.Lathrope@meggitt.com |
| A program to design, manufacture and test a functional aircraft component that is fully optimised for additive layer manufacture. A standardised optimisation capability will be generated by capturing process “lessons learned”.<br>NATEP Grant £142,500 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Configurable Double Sided Cooled Integrated Power Module** | • Semelab Ltd<br>• Pre-Met<br>• Rolls-Royce plc (customer) | Julian Thomas<br>Julian.Thomas@ttelectronics.com |
| The project is intended to standardise power modules by having a single switch that can be configured to make various topologies. The single switch will be replaceable meaning maintenance can be done to power modules. The single switch will have a double sided cooled technology as a way of replacing wirebonds and improving the performance.<br>NATEP Grant £ 127,200 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Dry Drilling of Aluminium Alloys** | • Teer Coatings Ltd<br>• Kyocera Unimerco Tooling ltd<br>• Airbus (customer) | Dr Hailin Sun - R&D Technology Centre Manager<br>hailin.sun@miba.com |
| Dry, in-situ drilling of aluminium alloys, with no significant loss of performance, will reduce costs while improving the work place environment. The project facilitates dry-drilling with newly designed tools exploiting the latest high performance solid lubricant coatings<br>NATEP Grant £105,670 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Plasma Cleaning in MCM Advanced Manufacture** | • Welwyn Components Power & Hybrid<br>• Accelonix<br>• Rolls Royce plc (customer) | Billy Shaw – Engineering Manager<br>billy.shaw@welwyn-tt.com |
| This project will demonstrate that an innovative cleaning process can be introduced into the manufacture of advanced MCM (multi-chip module) devices for avionic engine controls, and automated to improve both yield and quality.<br>NATEP grant £70,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Innovative Aerospace Transport Tooling** | • Datum Tool Design<br>• Fleet Maintenance<br>• Bombardier Aerospace (customer) | Michael Maguire – Joint Managing Director<br>michael@datum-design.com |
| The project is to gain understanding of cost effective and re-configurable tooling to permit the manufacture of multiple transport systems for aerospace assemblies<br>Grant for R&D £47,640 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Automated Manufacture of Slot Liners (AMSL)** | • MEP Ltd<br>• Jackson Design Ltd<br>• SAFRAN Labinal Power Systems (customer) | Phil Hart – Managing Director<br>phil.hart@mep.co.uk |
| Aerospace power generators operate at high temperatures; moulded components which act as insulators must cope with demanding electrical output, stresses and strains. This technology delivers high quality, safe products whilst retaining manufacturing in the UK in the long term.<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Cure Capable Mandrels** | • CTES Ltd<br>• Retrac Composites Ltd<br>• GKN Aerospace (customer) | Liam Moloney – Director<br>liam@ctesltd.co.uk |
| To develop solutions for structural composite fibre placement tooling that is cure-capable and CTE-matched to the component, for use in the automated production of composite wing spars and other large composite aerospace structures<br>NATEP Grant £149,770 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Metal Matrix Composites for Helicopter Applications** | • Aerospace Metal Composites Ltd<br>• Mettis Aerospace<br>• Leonardo MW Ltd (customer) | Dr Stuart Godfrey – Business Development Manager<br>stuart.godfrey@materion.com |
| This project will develop both an aluminium and Silicon Carbide (SiC) metal matrix composite (MMC) material and create a forging supply chain specifically for helicopter applications. The funding will thus create a UK source (for the first time) for this high performance material which is required in the aerospace market.<br>NATEP Grant £ 150,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Fastening Forms in Composite Technology** | • Rotite Technologies<br>• Sigmatex<br>• University of Manchester<br>• Airbus Operations Ltd (customer)<br>• Aircelle Ltd (customer)<br>• Ejot UK Ltd (customer) | Stuart Burns<br>Founder and Innovation Director<br>stuart.burns@rotite.com |
| Lightweight structures and assemblies are essential for fuel efficiency and sustainable design. This project will develop, for the first time, integrally formed Rotite fasteners in composites, providing structural and weight saving solutions in contemporary materials.<br>NATEP Grant £139,500 | | |

| Project | Supply chain partnership | Contact |
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| **New Muffler Ducting for Air Distribution** | • AVS-SYS Ltd<br>• Arville<br>• Foam Techniques Ltd<br>• Raytheon (customer) | Andrew Whitehead – Engineering Director<br>awhitehead@avsupport.org.uk |
| The project is to design weight-saving and cost saving aerospace muffler ducts which will support the development of a new manufacturing facility in the North West of England providing employment opportunities and increased exports.<br>NATEP Grant £123,320 | | |

| Project | Supply chain partnership | Contact |
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| **Prep'ing Composite Moulds with Lasers For Enhanced Productivity and Quality** | • Advanced Laser Technologies Ltd<br>• CNC Robotics<br>• Cobham Antenna System (customer)<br>• EPM Technology (customer) | Roger Hardacre – Managing Director<br>roger.hardacre@altlaser.co.uk |
| The project will develop an advanced system that can clean, polish and repair moulds made of metal or composite used to produce composite parts. The intention is that a successful outcome will lower supply chain costs & improve productivity of skilled labour by developing an automated technology for cleaning composite material moulds The system can be in a bureau format for low frequency users, or for high frequency users it can be a factory based solution.<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
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| **Low Mass Composite Mould Tool (LMCMT)** | • KAMAN Tooling Ltd<br>• KAMAN Composites Ltd<br>• Hexcel Composites<br>• Ten Cate Advanced Composites<br>• BAE Systems (customer) | Paul Barrett – Managing Director<br>paul.barrett@kaman.com |
| The LMCMT project will revolutionise Composite tooling strategies across the Aerospace and Automotive sectors, delivering lower cost, lower energy and lower carbon footprint tooling to all of the major aerospace manufacturers making composite components. The objective of this R & D project is to Design, manufacture and test 2 off Proof of concept Low Mass Composite Mould tools.<br>NATEP Grant £146,560 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **HoleGun+** | • Third Dimension<br>• Insphere Ltd<br>• Airbus (customer)<br>• GKN Aerospace (customer) | Dr Tim Monks - Chief Technical Officer<br>tim.monks@third.com |
| The development of Third Dimension's "Optical Countersink Hole Inspection Solution" will dramatically improve manufacturing of complex aerospace components by simplifying inspection, reducing rework time, improving cycle time and significantly reducing overall cost of manufacture.<br>NATEP Grant £147,760 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **In-loom splicing for aerospace applications** | • AvOptics<br>• TT Electronics<br>• BAE Systems<br>• MOD - UK Chinook project team (customer) | Andrew Voizey – Managing Director<br>andy.voizey@avoptics.com |
| To develop a simple to use, novel in-loom mechanical splicing technology to enable the repair of fibre optic harnesses on aircraft.<br>NATEP Grant £149,760 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Project Fusion** | • AVPE Ltd<br>• South West Metal Finishing<br>• Airbus Innovations(customer)<br>• Airbus Group (customer)<br>• Renishaw plc (customer)<br>• LIMA (customer) | Chris Steel – Chairman<br>chris.steel@avpe.co.uk |
| AVPE is an SME supplying directly into Airbus' MRO business. Project Fusion will develop Airbus certified "Class 2" components manufactured using ALM technology with modified post ALM machining, NDT and surface treatment processes.<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Composite Electrostatic Transport Elements (CompETE)** | • AGC Aero Composites<br>• Element Materials Technology<br>• ENL Ltd<br>• Technical Fibre Products Ltd<br>• Airbus Operations (customer) | David Conway – Materials Technology Director<br>dave.conway@agcaerocomposites.com |
| The development of lightweight, shaped and damage resistant composite fuel pipe assemblies that by virtue of their tightly controlled electrical properties can be used safely in composite aircraft fuel tanks<br>NATEP Grant £131,090 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Digital High Performance Servovalve** | • Moog Controls<br>• 4C Electronics<br>• Moog Inc. (customer)<br>• Embraer Commercial Aviation(customer) | Dr Phil Elliott – R&D Manager<br>pelliott2@moog.com |
| The execution of electronic closed loop control within a small flight control servovalve has many benefits at the system level including: digital interface, reduced internal leakage, faster dynamic response, higher accuracy and smaller size. | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **UAV Engine Durability** | • Rotron Power<br>• A&M EDM<br>• Boeing (customer) | Alex Head – Technical Director<br>alex.head@giloindustriesgroup.com |
| This project has been devised to research novel methods for extending the flying durability of UAV rotary engines to a target of 1000 hours of Time Between Overhaul (TBO).<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Machine Connectivity & Manufacturing Intelligence** | • ATS UK<br>• Hitex Ltd<br>• Arrowsmith Engineering (Coventry) Ltd (customer) | Martin Kelman – Senior MES Consultant<br>martin.kelman@ats-global.com |
| The project will create a highly cost effective Machine Connectivity Module (MCM) which connects and monitors manufacturing processes using the latest technology in the fields of; embedded sensors, wi-fi communications and android based data processing & display platforms<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
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| **3D Moulded Circuits** | • Laser Optical Eng. Ltd<br>• Moulded Circuits Ltd<br>• MBDA UK Ltd (customer) | John Tyrer<br>johntyrer@laseroptical.co.uk |
| Develop a laser writing system capable of producing 3D copper tracks or circuits on 3D aerospace lightweight structures.<br>Create the ability to produce fully functional circuitry directly onto 3D parts, enhancing functionality and enabling them to become part of a larger product or system, thereby reducing size, weight and cost.<br>NATEP Grant £145,727 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Finite Measurement** | • Powerkut Ltd<br>• Coventry University<br>• Winbro Group (customer) | Peter Everitt – Director<br>pete@powerkut.co.uk |
| The project will build and market a new machine that is capable of processing gauge block calibration in an automated environment. This will address a market need for measurement results to improve at the same rate as materials technology in the aerospace sector and meet an increasing demand for consistent quality of results accessible for the whole supply chain.<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Long/continuous Fibre Reinforced Thermoplastic (CFRTP) Composite Processing** | • CCP Gransden Ltd<br>• Comco<br>• Bombardier (customer) | Robert McConnell – Director<br>robert@ccp-gransden.com |
| This project will seek to develop a flexible and adaptive system for proof of concept processing continuously reinforced thermoplastic composites for aerospace applications.<br>Grant for R&D £91,850 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Fastener & Stress Attenuator** | • Adhesion Technologies Ltd<br>• ENL Ltd<br>• Dopag (UK) Ltd<br>• Loop Technology Ltd<br>• Pressavon<br>• Leonardo MW Ltd (customer)<br>• Jaguar Land Rover Automotive PLC (customer) | Colin Wood<br>General Manager<br>colin.wood@adhesiontechnologies.com |
| Adhesion Technologies Ltd is developing a 'Fastener and Stress Attenuator' to replace rivets and underperforming laminate in aerospace structures. This will enhance payload capability and lifetime operating costs across the aerospace sector.<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Slave Fasteners for Automation** | • Kwikbolt Ltd<br>• i2M<br>• Wesco Aircraft (customer) | Dean Carran<br>Operations Director<br>dean@kwikbolt.com |
| To align with the future of aerospace manufacture this project aims to design and develop single sided temporary fasteners and their interfaces suitable for fully automated aerospace assembly processes.<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Distortion and Residual Stress Control for Manufacture** | • Silcoms Ltd.<br>• The AMRC with Boeing<br>• Sandvik Coromant<br>• Craftsman Tools Ltd<br>• Rolls-Royce plc (customer) | Andy Morris<br>Engineering Manager<br>andrew.morris@silcoms.co.uk |
| The partnership is working on a collaborative project looking to utilise the latest in FE analysis, residual and distortion stress management to optimise the engineering of high value, thin walled aerospace components. The project is aiming to keep the UK at the forefront of this highly skilled and competitive market.<br>NATEP Grant £120,000 | | |

| Project | Supply chain partnership | Contact |
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| **Cryogenic Research of Efficiency on Structural Titanium (CREST)** | • Hyde Aero Products Ltd<br>• Starrag UK Ltd<br>• Walter GB Ltd<br>• BAE Systems (customer) | Paul Mellor<br>Technical Director<br>pmellor@hydeaero.co.uk |
| The objective of this project is to determine and understand the benefits of Cryogenic rough machining strategies when applied to prismatic Titanium Structural Airframe components in comparison to the traditional emulsion application<br>NATEP Grant £101,670 | | |

| Project | Supply chain partnership | Contact |
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| **Triaging through NDT** | • Theta Technologies<br>• Manufacturing Technology Centre<br>• Rolls-Royce plc | Julian Wright<br>Managing Director<br>j.wright@thetatech.co.uk |
| This project will investigate a novel non-linear acoustic non-destructive testing (NDT) method for instant triaging of defective metal components in automated real-time go/no-go decision making. The state-of-the-art is too slow and too expensive for commercial applications but without NATEP funding this will remain an academic technology curiosity and industry will not benefit from the anticipated reduction in inspection times.<br>NATEP Grant £145,100 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Process Control Software Tool [PCST]** | • Line Business Services<br>• Amfax Ltd<br>• Cobham Mission Systems (customer) | Stewart Long<br>Projects Director<br>s.long@sovision.com |
| This project will develop a new process control tool targeted at SMEs which will help ensure that agreed processes are followed systematically, consistently and transparently within projects to support the completion of manufacturing and development projects to agreed quality, time and budget parameters<br>NATEP Grant £100,130 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Next Generation Single Crystal Helix** | • Investment Casting Systems Ltd<br>• C&M Mould Tools Ltd<br>• Resinex UK Ltd<br>• Rolls Royce (Precision Casting Foundry) (customer) | David Granados Alcala<br>Programmes Manager<br>David@investmentcastingsystems.co.uk |
| Design and production of an innovative feature which will increase the production yield of the casting process for single crystal turbine blades & structures.<br>NATEP Grant £142,600 | | |

| Project | Supply chain partnership | Contact |
|---|---|---|
| **Mouldable Liners** | • SKF<br>• WMG HVM Catapult<br>• Leonardo MW Ltd (customer) | Grant Dennis<br>Project Manager<br>grant.dennis@skf.com |
| This project will develop greater flexibility and customisation to plain bearings technologies, permitting them meet the changing and demanding requirements of the aerospace market.<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
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| **Textilub – a novel self-lubricating liner** | • SKF<br>• Tiab Limited<br>• Leonardo MW Ltd (customer) | Michael Colton<br>Local Product Development Manager<br>Michael.Colton@skf.com |
| Textilub will deliver the next generation of novel plain bearings to the meet the changing and demanding requirements of the aerospace market<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
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| **Metrology for Additive Manufacturing** | • Insphere Limited<br>• Renishaw<br>• Airbus Group Innovations (customer) | Ben Adeline<br>Chief Executive<br>ben@inspherelt d.com |
| This project will develop an innovative and highly sought after metrology verification method for additive manufacturing processes. This will enable unique techniques for additive manufacturing process control supporting the certification of AM parts for production aerospace use.<br>NATEP Grant £122,800 | | |

| Project | Supply chain partnership | Contact |
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| **Combustion Chamber Process Innovation** | • Nasmyth Technologies Ltd<br>• Hucknall Sheet Metal Ltd<br>• GE Aviation Czech (customer) | Adrian Hill<br>Engineering Manager<br>adrian.hill@chinnltd.com |
| Nasmyth Technologies Ltd will develop innovative processes for the manufacture of combustion systems in aircraft engines and support long term growth of jobs in the high value-added aerospace sector.<br>NATEP Grant £150,000 | | |

| Project | Supply chain partnership | Contact |
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| **Cooled Core Die Blocks** | • Gardner BTC Ltd<br>• Material Solutions<br>• Invest Tech Ltd (customer) | Keith Fulford<br>Project Manager<br>kfulford@gardner-aerosapce.com |
| Gardner BTC Ltd., manufacturer of Injection dies is developing new technologies to produce core dies using alternative advanced manufacturing methods, specifically focused on providing better injected parts and reduced non-conformance.<br>NATEP Grant £52,150 | | |

| Project | Supply chain partnership | Contact |
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| **Lightweight Pipe End-Fittings** | • Sigma Precision Components UK Ltd<br>• 3T RPD Ltd<br>• Customer | Mike Andreae - Director of Technology and Improvement<br>michael.andreae@sigmacomponents.co.uk |
| The Lightweight Pipe End-Fittings project will design rigid pipe end-fittings for minimum mass, suitable for additive manufacture technology and test them in accordance with aero engine operating conditions.<br>NATEP Grant £143,000 | | |

| Project | Supply chain partnership | Contact |
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| **Ultrasonic Assisted Machining of Aerospace Composites (USAMAC)** | • Teer Coatings Ltd<br>• Kyocera Unimerco Tooling Ltd<br>• BAE Systems (customer) | Susan Field<br>Collaborative Research Coordinator<br>sue.field@miba.com |
| USAMAC will demonstrate a new generation of drills, where tool design and state of the art coatings will enable the full benefits of ultrasonic assisted machining technology to be realised in the drilling of advanced composite stacks.<br>NATEP Grant £137,600 | | |

| Project | Supply chain partnership | Contact |
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| **Integrally Bladed Rotor (IBR) – Abrasive Barrel Milling Cutter** | • ITP Engines UK Ltd<br>• Technicut Ltd<br>• Geo Kingsbury<br>• Industria de Turbo Propulsores, SA (customer) | Carlos Cenal<br>Project Engineer<br>Carlos.Cenal@itp-engines.co.uk |
| Industrial research to develop the capability to manufacture gas turbine integrally bladed rotors (IBR's) using barrel milling tools thereby reducing manufacturing time and improving quality.<br>NATEP Grant £131,650 | | |

| Project | Supply chain partnership | Contact |
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| **Integrally Bladed Rotor (IBR) – Abrasive Flow Machining** | • ITP Engines UK Ltd<br>• Extrude Hone Ltd<br>• Brunel University<br>• Industria de Turbo Propulsores, SA (customer) | Carlos Cenal<br>Project Engineer<br>Carlos.Cenal@itp-engines.co.uk |
| Industrial research to model the effects of an Abrasive Flow Machining polishing process on aerofoil profiles and the development of predictive process controls which will lead to a reduction in manufacturing time and an improvement in quality.<br>NATEP Grant £107,350 | | |

| Project | Supply chain partnership | Contact |
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| **Improved Harness Technology (IHT)** | • Trackwise Designs Ltd<br>• Boston Design Consultants<br>• Fokker Elmo BV (customer)<br>• Messier-Dowty Ltd (customer) | Philip Johnston -Managing Director<br>philip.johnston@trackwise.co.uk |
| Trackwise has developed a means of producing length-unlimited multilayer flexible printed circuit boards. This project will accelerate the adoption of this technology as a weight saving replacement for conventional wiring harnesses with associated carbon reduction benefits for aerospace platforms and payloads.<br>NATEP Grant £84,000 | | |

| Project | Supply chain partnership | Contact |
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| **Fe-36Ni MMC for space and aerospace applications** | • Aerospace Metal Composites Ltd<br>• ExoTec Precision<br>• NASA Goddard Space Flight Centre | David Tricker<br>Technical Manager<br>david.tricker@materion.com |
| This project will develop a Fe-36Ni metal matrix composite (MMC) material. Specifically this composite material will have reduced density and improved thermal expansion properties compared to more conventional Invar® type systems<br>NATEP Grant £120,000 | | |

| Project | Supply chain partnership | Contact |
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| **Innovative Aerospace Transport Tooling** | • Datum Tool design<br>• Fleet Maintenance Ireland Ltd<br>• Bombardier (customer) | Michael Maguire – Director<br>michael@datum-design.com |
| The project will gain understanding of cost effective and re-configurable tooling, to permit the manufacture of multiple transport systems for aerospace assemblies.<br>R&D Grant awarded £87,446 | | |

| Project | Supply chain partnership | Contact |
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| **Modular Galley for Assembly** | • Belfast Aircraft Stress Engineers Ltd<br>• Moyola Precision Engineering Ltd<br>• Denroy Plastics Ltd<br>• SR-Technics(customer) | Peter Hinds – Strategic Business Director<br>Pete.Hinds@basegroup.co.uk |
| The project collaborators will develop a modular design concept for an aircraft galley. The modular concept is to enable a simplified manufacturing and assembly process<br>R&D Grant awarded £95,025 | | |

| Project | Supply chain partnership | Contact |
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| **Hydraulic Hand Tool Development** | • FE Robinson Ltd<br>• Klauke UK Ltd<br>• Airbus Operations (customer) | Guy Williams- Managing Director<br>guy.williams@ferobinson.co.uk |
| UK SME FE Robinson is leading the design and development of a range of lightweight "Smart" Hydraulic hand tools tailored for use in the aerospace sector. For the first time, the customer will be enabled in achieving substantial efficiency improvements in certain manual operation wing production processes | | |

| Project | Supply chain partnership | Contact |
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| **Resistive Composite Fuel System Assemblies (ReComp)** | • Tods Aerospace<br>• Element Materials Technology<br>• Technical Fibre Products Ltd<br>• ENL Ltd<br>• Parker Chomerics<br>• Airbus Operations Ltd | info@natep.org.uk |
| Development of multi-part manifold-style resistive composite fuel system assemblies incorporating conductive elastomer fuel seals to replace costly and installation-intensive bonding leads. The project focus is to provide an innovative functional product, reduce weight, reduce cost and achieve technology/manufacturing readiness in support of future high-volume production.<br>NATEP Grant £149,800 | | |