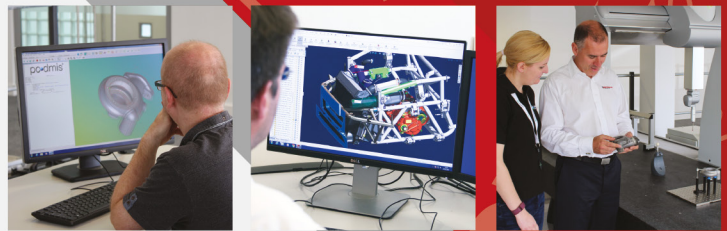




PERFORMANCE PROJECTS



Professional Design & Engineering Services

Design & Engineering Services...

Performance Projects specialises in engineering design, project management and procurement. We deliver a complete end-to-end service, from the development of an initial concept through to the supply of fully functioning hardware as required. Our work spans a number of industries, including top-flight motorsports and automotive programmes.

In addition to supporting clients' engineering departments on core products, we are often commissioned by marketing departments to showcase the integration of new technology into their existing portfolio, undertake marketing or technical validation with fully functioning bespoke examples, or to provide unique hardware for innovative promotional campaigns.



From initial concept through to engineering design, build and handover support, we ensure customers are engaged and in control at every stage. We work closely with clients' in-house capabilities, providing complementary services in capability or capacity, meeting the highest expectations.

Performance Projects works within clear time & budget constraints, and regularly helps bridge the so-called TRL (technology readiness level) 'Valley of Death', taking projects from initial ideas to fully functioning items in real operational environments.

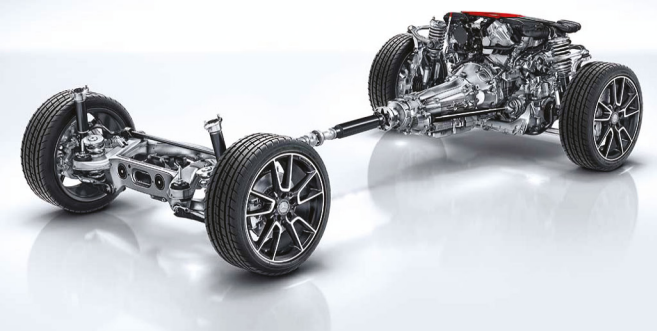




Our Established Markets...

Motorsport

Performance Projects operates at the forefront of international motorsport. We provide design, analysis and hardware to some of the world's leading teams, including race winning Formula One cars, Le Mans Prototypes and championship winning World Touring Cars. We are versatile in our approach, with proven skills in clean sheet proposals, designs to detailed customer specifications and the development of existing designs.



Automotive

Performance Projects works directly with major OEM's and Tier 1 suppliers to provide fully functioning one-off vehicles. Whether the client seeks to demonstrate performance, luxury or the integration of new technology, we can design and deliver full turnkey vehicles, ready for use. We also produce bespoke vehicles for private individuals who desire the ultimate in exclusive and unique creations.



Niche Automotive & Aftermarket

We provide clients with the resource to design, test and supply new automotive products, whether it be an all-new niche vehicle with specialised capability or an aftermarket upgrade kit addressing performance and reliability. Our diverse portfolio of customer projects includes the creation of next generation safety harness systems to incoming regulations, the design of a modular fuel injection system complete with all the sensors required to directly replace a range of carburettors, and the design and development of a portfolio of products for an aftermarket performance products brand.



Historic Road & Race

Performance Projects enables historic vehicle marque specialists to take on complex work, whether it be the restoration of particularly rare vehicles or viable remanufacture in low to medium volume of more common components. We reverse engineer technically challenging components & assemblies utilising information from original parts (in whatever condition available), existing drawings and mating parts as applicable, and manufactured using the most appropriate processes. Our portfolio ranges from complicated machined castings for cylinder blocks and timing covers, through to critical assemblies such as water and oil pumps.

Agricultural

The extreme vibration, hard durability cycles and 'in the field' serviceability are key challenges for agricultural vehicles. The advent of autonomous and semi-autonomous operation pose new and unique challenges that are without precedent, both in the technical requirements and the overall vehicle layout. Performance Projects is supporting clients at the forefront of the most advanced vehicles emerging today.



Our Emerging Markets...

Marine

Performance Projects' capability in bespoke, high quality design and manufacture, is ideally placed to meet the unique demands of both the luxury and sporting marine industry. We offer clients the chance to develop new and improved aftermarket products, or support the opportunity for clean sheet build with bespoke hardware inside and out. We have an excellent record in seamlessly incorporating new & interesting features into existing designs, opening up the opportunity for clients to fulfil the requirements of even their most demanding customers.



Aerospace & Defence

Performance Projects' proven design and analysis capability, combined with a fresh approach to resolve challenges, enables us to meet the high demands of Tier 1 and Tier 2 suppliers in the Aerospace & Defence industries. We are particularly well suited to challenges which require a rapid response, proof of concept field test or which have a unique application requiring bespoke hardware.



Typical Project Pathway

Performance Projects has the end-to-end capability to take clients from initial ideas through to fully functioning, fully supported, products.

Customers may also choose to take advantage of one particular service, for instance, to use our design service to complement their own in-house capability, be it for additional capacity or specialist knowledge.

Alternatively, we may be commissioned to develop a client's very open concept into a detailed brief, properly defining the scope of work, identifying & fulfilling the skills required, providing budget estimates and managing the project to completion as required.

Whether it is an end-to-end project, or the support of a specific task, Performance Projects enables clients to take ideas and challenges to fully functioning, usable, products.

DEVELOP THE BRIEF

Understand the challenge and formalise a technical brief containing:

- Overview of project objectives
- Critical features (performance, weight, finish)
- Operating conditions (load cases, service life)
- Undertake any concept or feasibility work
- Confirm timeframe & milestones



DESIGN

Engineering design & analysis is core to Performance Projects' service. With a variety of Computer Aided Engineering (CAE) approaches available, selecting the most appropriate is key to a successful result:

- Clean sheet design for all-new products or the reverse engineering and development of existing parts
- 3D scanning existing components using the latest Hexagon Metrology equipment as required
- Development of detail component drawings and CAD data for manufacture
- Full assembly CAD data and drawings for production, service and support
- Manufacturing jigs and service tooling

We also provide complementary disciplines, such as automotive stylists for A-class internal and external surfaces, aerodynamicists for automotive bodywork and industrial designers for consumer products.

The methods of manufacture, build, serviceability and end use are considered throughout the design process to achieve the best possible results.



ANALYSIS

Development of complete and appropriate CAD models enables the efficient use of advanced analysis. Such methods help ensure success in both form and function, and minimise unnecessary material use in quantity, specification and material treatment process.

- Kinematic and dynamic analysis to confirm clearance and refine dynamic behaviour.
- Finite element analysis (FEA) to optimise geometry for strength, stiffness and mass
- Computation Fluid Dynamics (CFD) to maximise aerodynamic or fluid flow performance
- Traditional calculation methods, usually applied via computer spreadsheets, both as standalone analysis and to verify the more complex methods such as FEA and CFD
- Animation and rendering to help with visualisation and promotion

The analysis processes work in conjunction with design, rapidly iterating to ensure confidence in the final product before production is started.



PROCUREMENT & QUALITY CONTROL

Situated in the heart of the Silverstone Technology Cluster, and with established links to the very best in low volume and specialist suppliers, Performance Projects offers the best possible procurement service for price, leadtime and performance in disciplines including:

- Fabrication (often using CAD data for Computer Numerically Controlled (CNC) cutting, bending and welding as required)
- Additive manufacture (3D printing).
- Moulding & casting (including low volume investment casting & vacuum formed moulding)
- CNC Machining (including 3 to 12 axis machining and moving chuck)
- Advanced composites for both structural and cosmetic use

Alongside supplier quality assurance, Performance Projects offers world class measurement and quality control from the Hexagon Metrology facility co-located at the Silverstone Park.



BUILD & TEST

Bespoke and very low volume builds require broad experience, attention to detail and close collaboration with manufacturers.

Performance Projects commissions and oversees builds at both Silverstone Park and at client premises. Build procedures follow the instructions set out on the assembly drawings, referencing specific industry regulations and manufacturer guidelines.

After completing the build process, assemblies go through the shakedown and testing routines specified in the project brief. Test results are collated for regulatory approval and client use as applicable.



PROJECT COMPLETION & HANDOVER

Performance Projects manages a careful handover to ensure that the client has all of the information and support required to take the product forward.

- This may include:
- Hardware supply
 - Drawing and CAD data supply
 - Technical data and analysis results
 - Manufacturing and procurement support
 - Customer support
 - User manuals



'Feedback and Development'

Initial concept to final solution...

A selection of our Case Studies

Aftermarket product portfolio

Garage56, established in 2014, was keen to firmly establish itself as a provider of quality aftermarket components for road cars, starting out with the Morgan 3 Wheeler. Performance Projects was tasked with starting the product range.

Performance Projects successfully designed, developed and delivered such a range, including replacement ECU (Engine Control Unit), usability enhancement kits such as the quick release spring ejector kits and the flagship Stage 1 and Stage 2 performance kits.

The product range has been a success, giving the brand exposure and access to the most prestigious dealers within the network, excellent press coverage, and sales surpassing original estimates.

Garage56



Innovative child car seat

Fitting one child car seat in the back of a car makes the centre seat uncomfortably narrow. Fitting two rear child seats makes the centre seat unusable in a practical manner.

The safe fitment of three child seats is usually impossible. Performance Projects proposed a solution and undertook the design, manufacture and testing of fully functioning units which could be easily offset from the cars Isofix mountings, locking safely in the offset position and allowing the third, centre space, to be used as originally intended.

The project was a success, proving compliance to the latest 'iSize' regulations (including crash tests), and undertaking field trials with positive end-user feedback. The development of the seats has proved legislative compliance and commercial potential, enabling high volume manufacture to be investigated.



Fully autonomous vehicle

Farming faces a constant challenge to find the labour required for key tasks. Advances in technology allow the potential for fully autonomous, commercially viable, agricultural hardware to revolutionise the industry.

Dynium Robot approached Performance Projects to undertake the layout and all mechanical design of this unprecedented and innovative autonomous vehicle, creating not just the vehicle, but a platform for carrying new robotic technologies for agricultural 'and other' applications.

The project integrated sub-systems from partner suppliers into a bespoke compact chassis and top frame assembly, making a fully functioning vehicle. Key considerations were required for the harsh and varied operational environment, as well as the creation of a ruggedly styled product that could be showcased within the industry.

In addition to providing full mechanical design capability, Performance Projects worked closely with the customer to refine the capability, and unlock additional funding through InnovateUK.

Dynium Robot



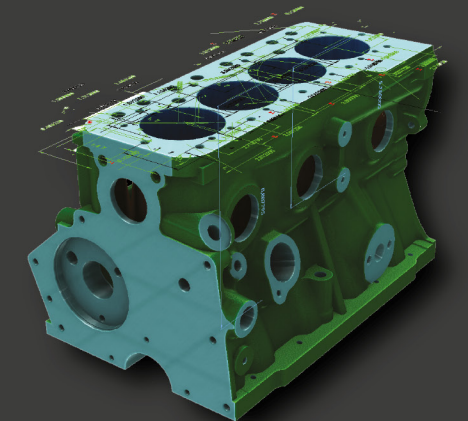
Engine block remanufacture

The "A Series" engine was used by the British motor industry in high volume across a wide range of small cars, including the original Mini. With supply of original parts almost dry, engine builders face not only higher cost but more importantly a major logistical issue of sourcing blocks on demand.

Performance Projects was approached by a marque specialist to reverse engineer a specific variant of "A Series" engine block. Modifications that would have been made by engine tuners in the 1960's were incorporated, with slight adjustments to the casting made to allow those modifications to be made reliably.

Close liaison with foundries and machine shops ensured that the features desired for modern manufacturing methods were included.

A full set of detailed drawings and CAD data were supplied, enabling manufacture at the customer's chosen suppliers, and allowing supply of high quality parts on demand for engine builders.



Background

Performance Projects was established in 2010 to provide the very best mechanical design capability and project support, and is led by chartered engineers Chris Horton (Managing Director) and Terence Goad (Technical Director).

Chris graduated from Imperial College, London, quickly developing a strong record of delivery in technical programme management and business development at world renowned motorsport and automotive powertrain manufacturer Cosworth Ltd. Chris is responsible for Performance Projects' operational and commercial activity, as well as overseeing project delivery.

Terence graduated with a First Class degree from Brunel University, before joining the aerospace research industry. He then moved into the niche automotive and motorsport domain, working at Ray Mallock Ltd on the Saleen S7R supercar and then onto Formula 1 with Benetton, Renault and finally Toyota, where he worked within the Advanced Projects Group identifying and devising potential improvements across all areas of the car. Terence leads Performance Projects' design and analysis capability.

Based at Silverstone, UK, in the very heart of the Silverstone Technology Cluster, Performance Projects has a proven record in innovation, resolving clients' challenges and developing new products.

For technical proof of concept design and development, new product development, or bespoke hardware for key clients or marketing use, please do not hesitate to contact Performance Projects today.



Why not give us a call - we will be
happy to provide you with our advice
and a competitive quotation...

+44 (0)1327 856032

enquiries@performance-projects.com





PERFORMANCE PROJECTS

Performance Projects Ltd.

Silverstone Innovation Centre

Silverstone Circuit, Northamptonshire NN12 8GX

T: +44 (0) 1327 856032 E: enquiries@performance-projects.com www.performance-projects.com