

Lotus Engineering



“The most elegantly and traditionally Lotus solution is the one with the least number of parts, effectively deployed.”

Extract from 'Definitions and Philosophy of Lotus' Engineering Policy' – 1975

The Lotus difference - welcome to Lotus Engineering

In this brochure we could detail all our facilities and capabilities – it makes for a very impressive list. But to be honest, our key rivals could provide something very similar.

So what does attract clients to Lotus Engineering?
What makes us different?

We believe that what sets Lotus apart is our unique blend of passion and technical excellence, qualities ingrained in our culture by the company's visionary founder, Colin Chapman.



Lotus Engineering



A brilliant heritage, a bright future

Colin Chapman built his first racing car in 1948 and founded the Lotus Engineering Company in 1952. Over the years iconic sports cars such as the Elan, Elite, Esprit and Elise, together with countless motorsport triumphs including Formula 1, have assured the company's prominence worldwide.

From creating the template for the modern Formula 1 car to spearheading 4-valve technology, from pioneering active suspension to bringing to production the bonded aluminium chassis, Lotus has thrust breakthrough after breakthrough into the automotive arena.

Underpinning every achievement has been the relentless passion and visionary innovation for which

Chapman was famous and that are now embedded in the Lotus culture.

Chapman championed performance through light weight and insisted that cars should be fun to drive; those values remain as important and relevant in today's global automotive industry as they ever were.

Continuing the Chapman philosophy of blending passion with technical excellence, Lotus today is well placed to tackle and solve the complex challenges of the modern automotive world.

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Global reach - Lotus Engineering around the world

A global company tuned to local needs

Lotus is a truly global business. We sell our sports cars in 28 countries and they are engineered to meet many divergent market and legislative requirements.

Our global market capability is reflected in our engineering consultancy business. Our client base includes all the major car manufacturers and increasingly we are attracting new companies from emerging markets such as India and China.

Servicing the diverse needs of our customers has led us to establish engineering centres in the important US, Chinese and South East Asian arenas. And as the world changes, Lotus continues to change with it.

But it is not just being geographically close to the client that counts. Delivering our expertise and knowledge in a way that is relevant to the client, that fits culturally and practically, is paramount. For some customers this means taking the project away to deliver a turnkey solution. For others we place key expertise into the client's team to lead their programme and impart knowledge.

The core Lotus competencies are relevant across most markets, but the reasons and ways they are relevant do vary. By understanding this, we can help our clients in a way that works best for them.

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Thinking green is part of our culture

Green cars are worthy but dull – right? Not if you come to Lotus.

We are not alone in recognising that the automotive industry must do more to address its environmental impact, through reducing CO₂ emissions and improving the recyclability of the materials it uses.

And we believe that the best way we can help our clients to achieve this is through developing vehicles that also excite and inspire consumers. It is a philosophy we have adhered to for years with our own cars that through a combination of light weight and efficient engines are a sheer pleasure to drive.

Our track record in developing and producing clean and efficient gasoline engines, biofuel vehicles, hybrids and electric vehicles is already impressive and extensive. In fact, as we head into a new automotive era, the technology of CO₂ reduction will become central to our engineering business.



Acoustic head for NVH measurement

Understanding your needs and those of your customers

In the fast-moving automotive industry, Lotus' expertise and knowledge attract a wide variety of clients, including established car makers from Europe, North America and Japan, through to new companies emerging from the rapidly expanding Asian and South American markets.

Exciting changes in the market are also attracting non-automotive companies into the industry. Our unique blend of technical expertise and proven ability to create successful products that stand out in the marketplace makes Lotus the obvious partner to help both new and established companies to flourish.

To improve the value we offer, our focus stretches far beyond the immediate needs of our clients. Ingrained in our approach is the need to understand the demands of our clients' customers, the vehicle's end-users.

We appreciate this facet of business better than most, thanks to our dual role as engineering consultancy and car manufacturer.

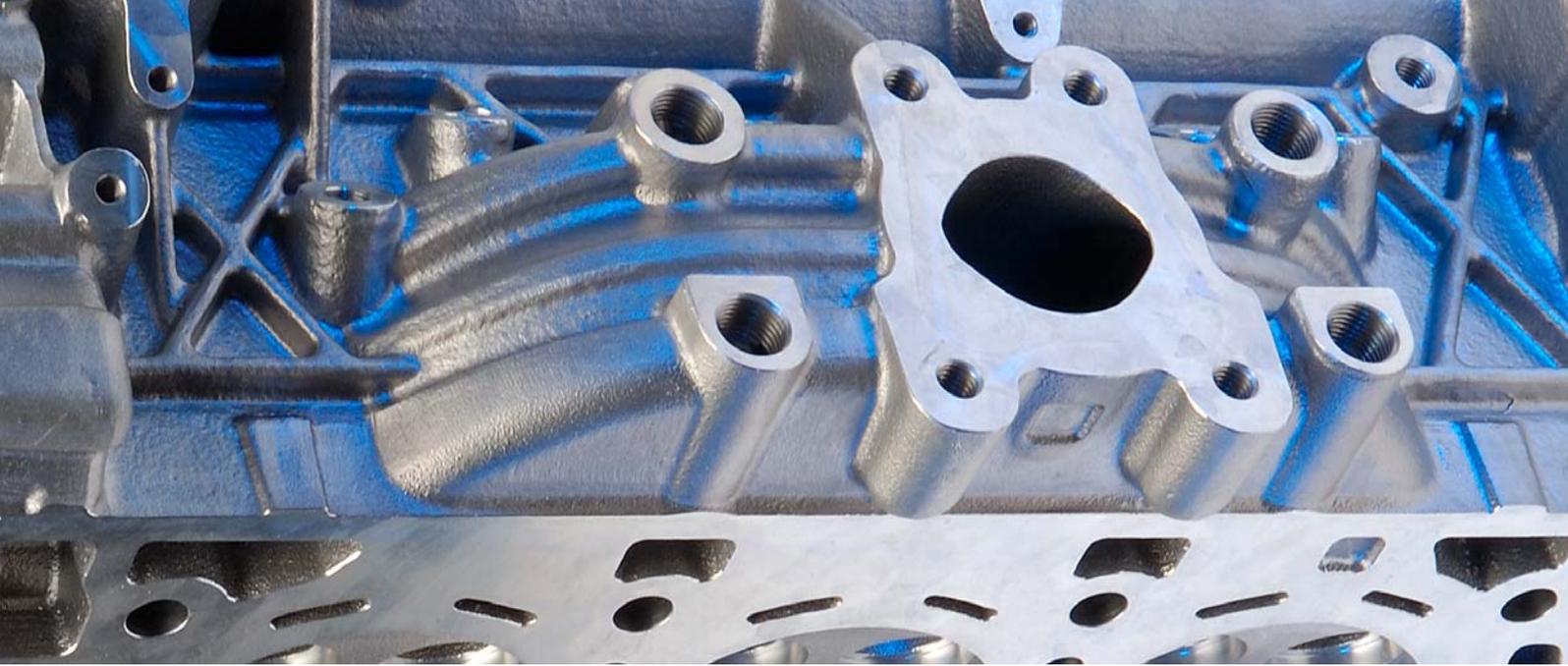


Lotus Cars – a vivid demonstration of what we can do

As well as providing exceptional consultancy services to our clients, we at Lotus have the rare advantage that we also design, develop, manufacture and sell cars to a global customer base. This is demonstrable proof that Lotus Engineering can produce fun to drive, thrilling products through fundamentally efficient design that meets world-class quality standards.

Lotus cars are the embodiment of our engineering ethos – that is, to produce captivating niche vehicles notable for their excellent driving dynamics and efficient performance. The purity of the Lotus driving experience is what delights our customers and inspires the press to shower accolades on our cars.

The experience gained from producing our own cars – creating an intelligent body structure that is both lightweight and rigid; tuning mass-produced engines for improved performance and character yet retaining, and even improving, their efficiency; packaging it all in an alluring design – can be turned quickly to our clients' advantage.



Lotus Integrated Exhaust Manifold

Efficient Performance - driving down CO₂

At Lotus we have embraced the growing challenge of diminishing oil reserves and stricter emissions legislation. Building on our industry-leading expertise in technologies such as gasoline direct injection (GDI), cylinder-deactivation, downsizing and alternative fuels, we are ideally placed to help car manufacturers to produce environmentally friendly vehicles without sacrificing performance.

Pressure charging is the cornerstone of powertrain downsizing, and is an area where Lotus has years of experience. This, coupled with expertise in advanced valvetrain, base engine and combustion technologies, clearly places Lotus at the forefront of the development of highly efficient, downsized engines that today's marketplace demands.



EVE Hybrid engine

Efficient Performance – thinking green

Environmentally friendly performance cars? What once seemed a fantasy is now a reality.

We are applying our expertise to produce vehicles and engines that use green alternative fuels. This reduces net carbon emissions and use of fossil fuels, but at the same time we at Lotus are showing that there can be performance benefits, too.

Hybrid and electric technologies are increasingly gaining consumer acceptance as a greener alternative. By combining our powertrain, control systems and vehicle expertise we are developing these vehicles that achieve lower CO₂ emissions in, crucially, a cost-effective way.



Driving Dynamics – putting the pleasure into driving

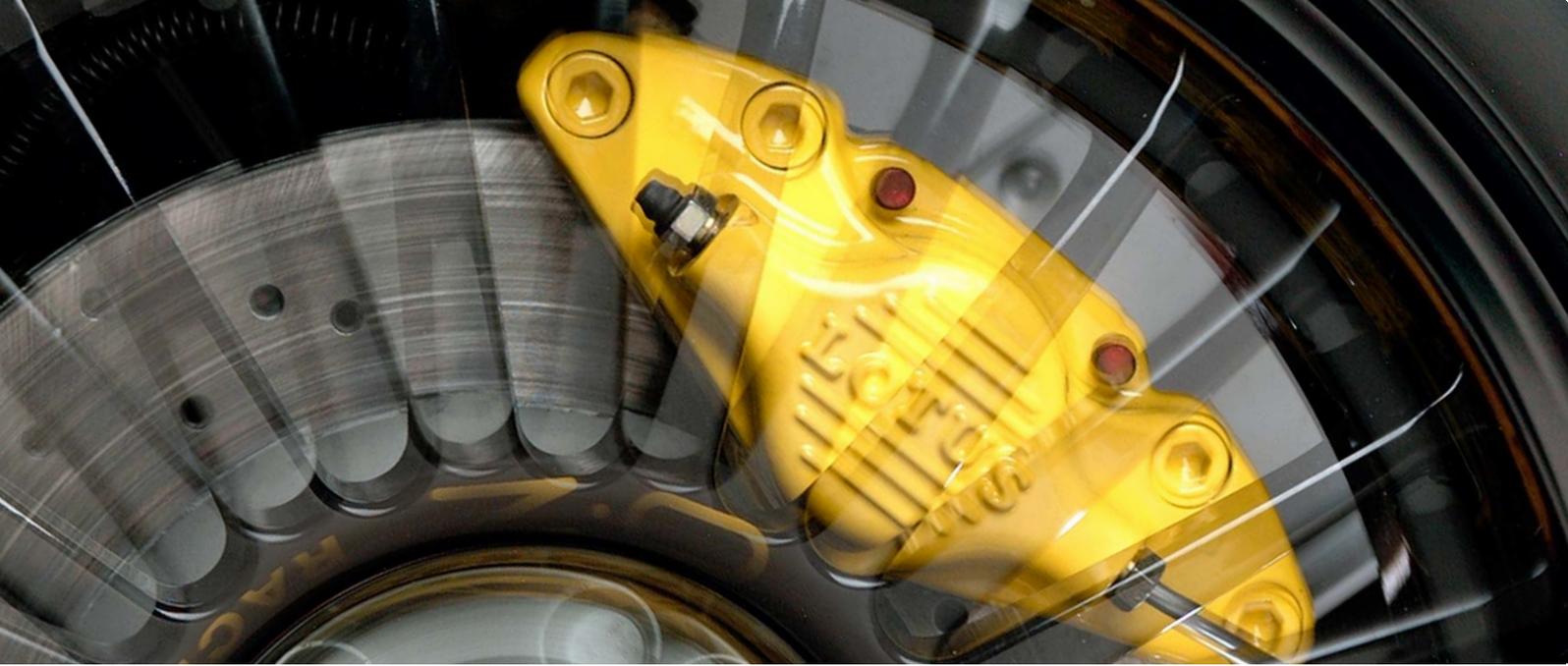
A car that is good to drive is a car that consumers will want to buy. That is the well-proven essence of Lotus' approach to driving dynamics.

Rather than take just one dynamic element in isolation, we begin the process of engineering driving dynamics by considering the vehicle as a whole.

Mindful of how ride, NVH, handling, aerodynamics, stability, performance 'feel' – and more besides – interact and affect each other, we are able to more effectively engineer the dynamic character of the vehicle.

Because of our intrinsic and comprehensive understanding of driving dynamics on all levels, we are uniquely qualified to develop and evaluate the viability of new concepts and technologies. At this early design stage our intimate knowledge of the very latest computer aided engineering techniques and finely developed skills for data analysis contribute towards more 'right first time' solutions.

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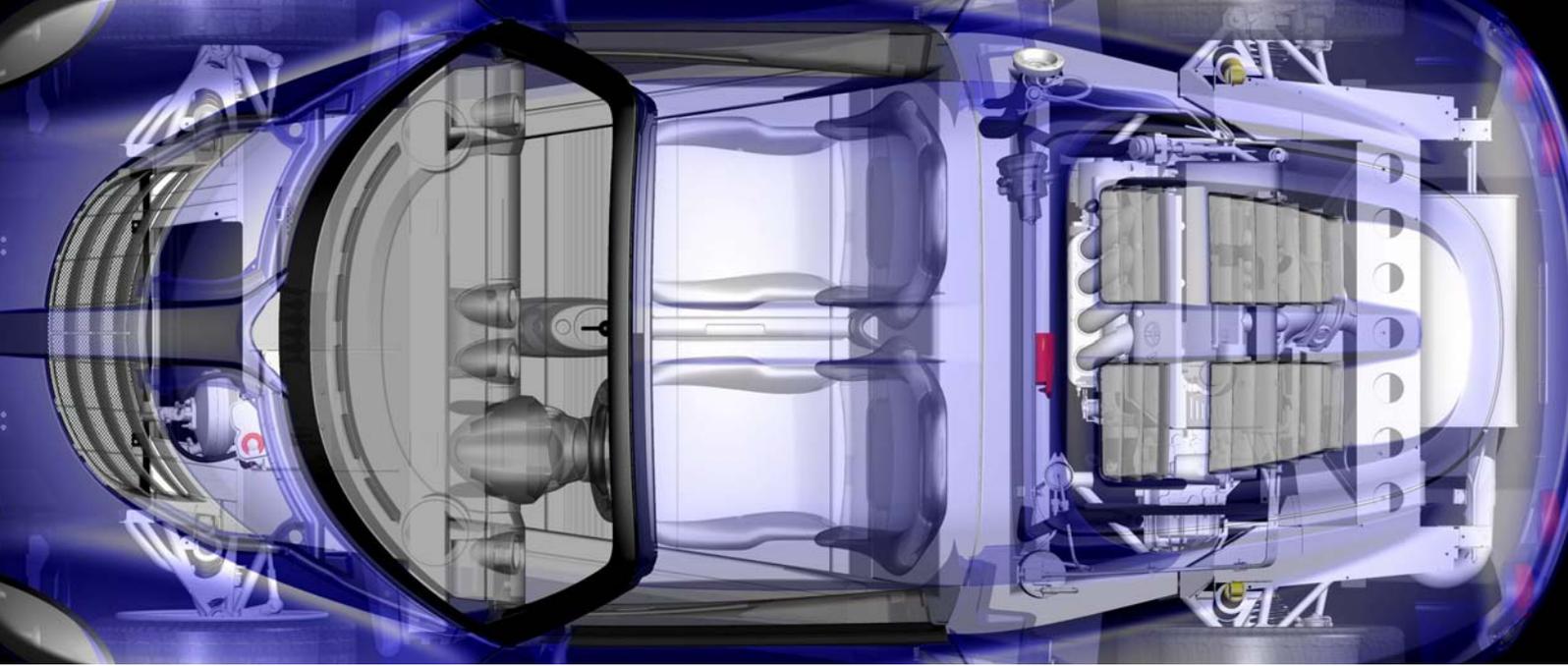


Driving Dynamics – the important ‘human touch’

Held in worldwide regard, our expert driving dynamics engineers have unsurpassed experience of what makes a car special to drive and how to make it achieve our clients’ targets for overall driving dynamics. We bring our specialist expertise to bear to create a vehicle that is exceptionally rewarding to drive.

Our driving dynamics engineers can not only quickly identify problem areas and recommend appropriate remedies, they can also suggest efficient ways to create specific dynamic attributes that suit a vehicle’s character or a client’s corporate DNA.

Computers, technology and raw data can help to define and quantify driving dynamics, but ultimately it is the driver behind the wheel who needs to be impressed.



Lotus Elise platform

Exciting Niche Vehicles – the building blocks are in place

Exciting niche vehicles are a commercially viable reality – we know this because Lotus has a global business based on the fact. Our extensive experience of engineering and manufacturing low-volume niche vehicles enables us to provide our clients with a fast and cost-effective way of bringing highly desirable cars to the marketplace.

Existing and future platforms within the Group Lotus portfolio offer clients the opportunity to produce their own exciting niche vehicles from a capable, proven base with greatly reduced levels of engineering and manufacturing investment.

The Elise platform has been used both by Lotus and by our clients as the base for some remarkable sports cars. Future Lotus platforms will present even greater opportunities for our customers to create exciting, dynamic and visually stunning vehicles.

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Lotus Aluminium Performance Cross-over (APX) concept

Exciting Niche Vehicles – creating desire

Sometimes, the only way to create a product that will stand out or redefine its market segment is to start from a clean sheet. We work with our clients to create bespoke, low-investment architectures for clearly focused niche vehicles, often low-volume sports cars incorporating relevant and innovative technology. Our key advantage is the know-how to profitably engineer these niche vehicles for our clients.

The values that Lotus instils into its own products are often the same attributes that our clients would like to enhance in their vehicles. By applying our expertise and a little Lotus magic, engine performance upgrades, chassis and vehicle tuning, and revised styling can be brought together in exhilarating, range-topping variants.

However, there are many examples of cars throughout history that have not relied on performance for their character and soul. Lotus has a breadth of understanding that ensures we can engineer any type of vehicle so that it truly engages with the customer – it is why clients come to us when they want a vehicle that will turn heads, entice new customers and impress the media.

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Lotus Design – passion and perspective

Strong proportion, emotional form, dynamic line, innovative material choice and distinctive graphics are what, subconsciously, create a first and often lasting impression with a customer. In an increasingly competitive market, innovative and exciting design is relevant to all vehicle types and volumes.

Through our role of designing Lotus cars, Lotus Design has developed a unique understanding of what makes beautiful, iconic vehicles. We have applied this knowledge to a variety of low- and high-volume products for our international client base.

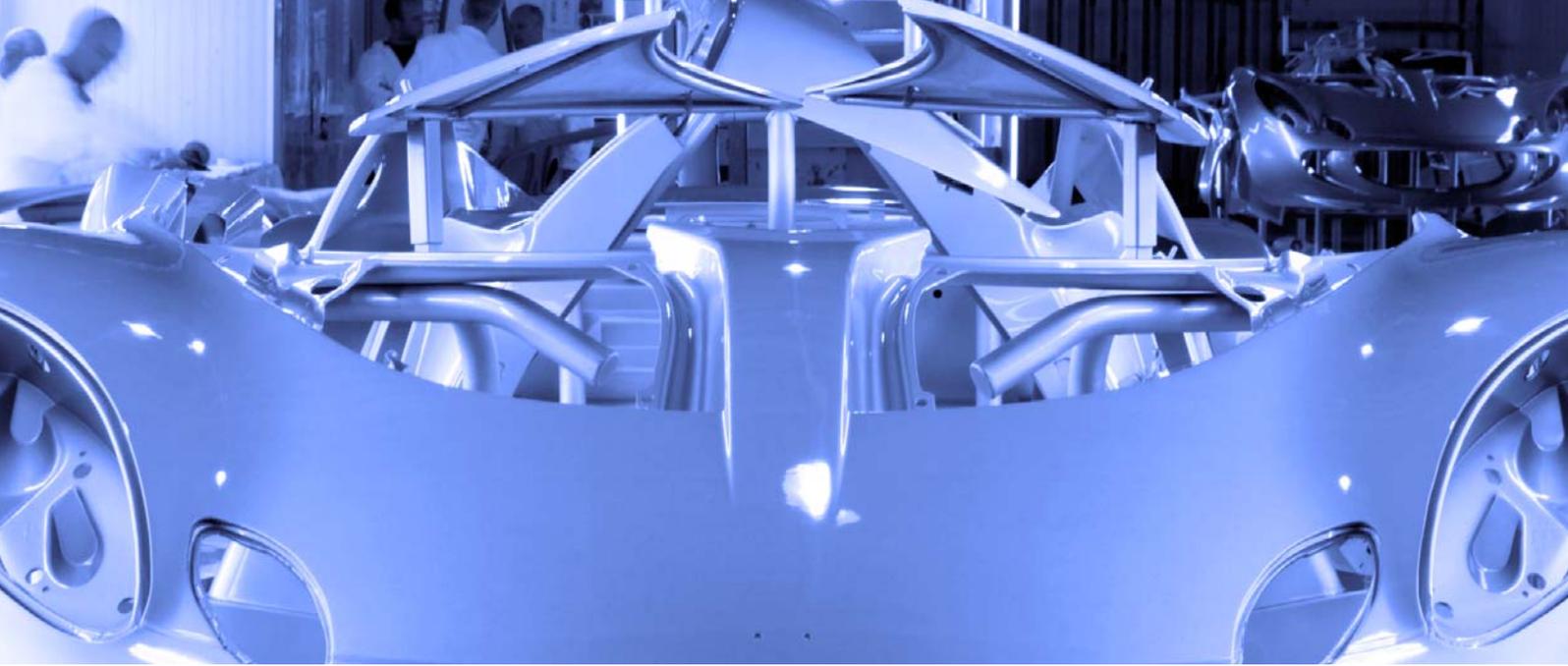
In each case we have worked closely with the client to deliver a product that fits their brand DNA and is commercially viable.

A passion for design and our breadth of experience allow us to influence the whole product development process from the first mood boards and sketches through to production release.

We bring value by offering a different perspective and specialist knowledge.



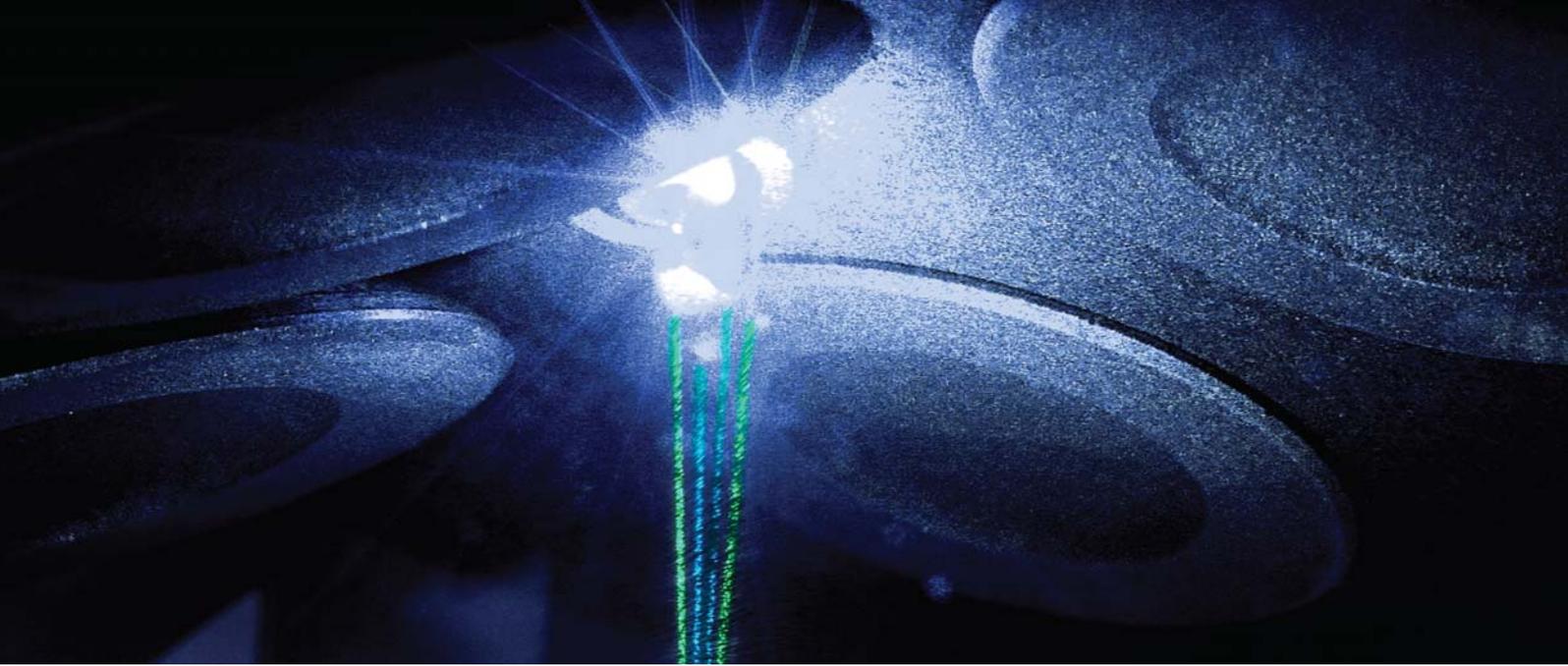
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World-class manufacturing

In recognition of our ability to build niche vehicles to the highest quality standards, Lotus won the World Class Manufacturing Award in 2005. It is not only Lotus cars that benefit from this. As a manufacturer and consultancy, our services can genuinely encompass the life of our clients' projects. Our manufacturing and assembly processes are geared towards niche-volume production.

We have the approach and methodology to build vehicles of exceptional quality within the constraints of low investment levels. And we can handle all activities from supplier quality assurance, logistics, assembly, paint and quality control – everything for high quality niche-volume production.



Lotus optical research engine

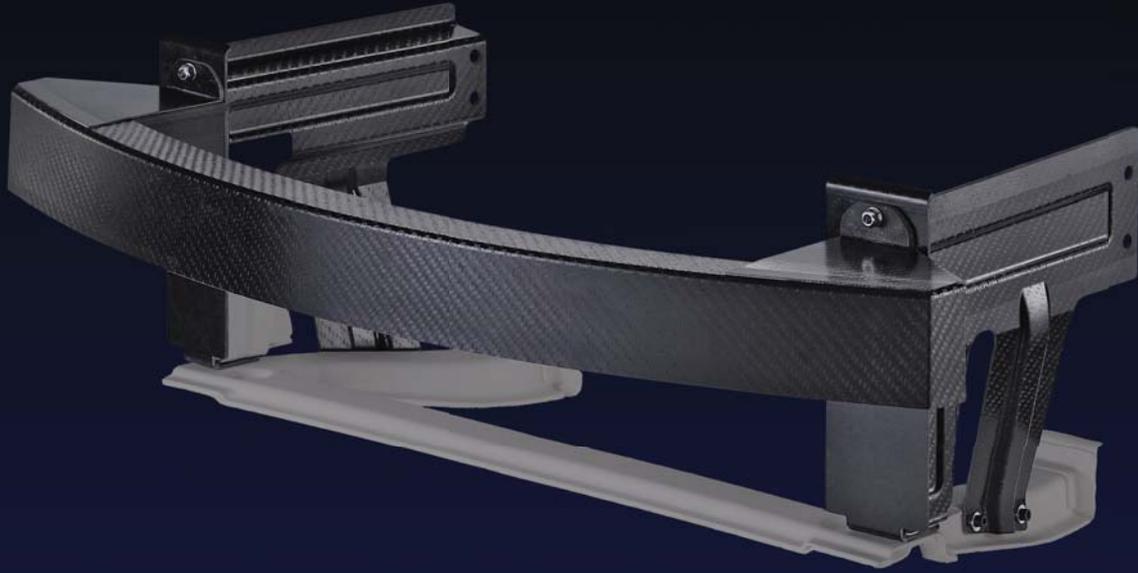
Technology and Research – building tomorrow’s world

Innovation has always been at the heart of Lotus and is needed now more than ever as automotive technology must face up to new environmental challenges.

Our research Active Valve Train (AVT™) is becoming the tool of choice in Western and Japanese research centres for studies into advanced combustion and engines.

Changes to automotive energy sources are also having an impact on what technologies we pursue. Consumers now have greater choice and fuel can vary

from one market to another. Currently, an engine that is optimised for one fuel is unlikely to run at all on another, and if it does it will not do so efficiently. To tackle this situation we are investigating truly flex-fuel engine concepts that can operate efficiently and cleanly on many different fuels.



ECOLITE advanced thermoplastic composite crash structure

Technology and Research – always adapting

With new types of vehicles – electric cars and hybrids, for instance – come fresh challenges, particularly in the field of driving dynamics. Stability, control and performance ‘feel’ issues will need to be addressed. In fact, we are already responding to them.

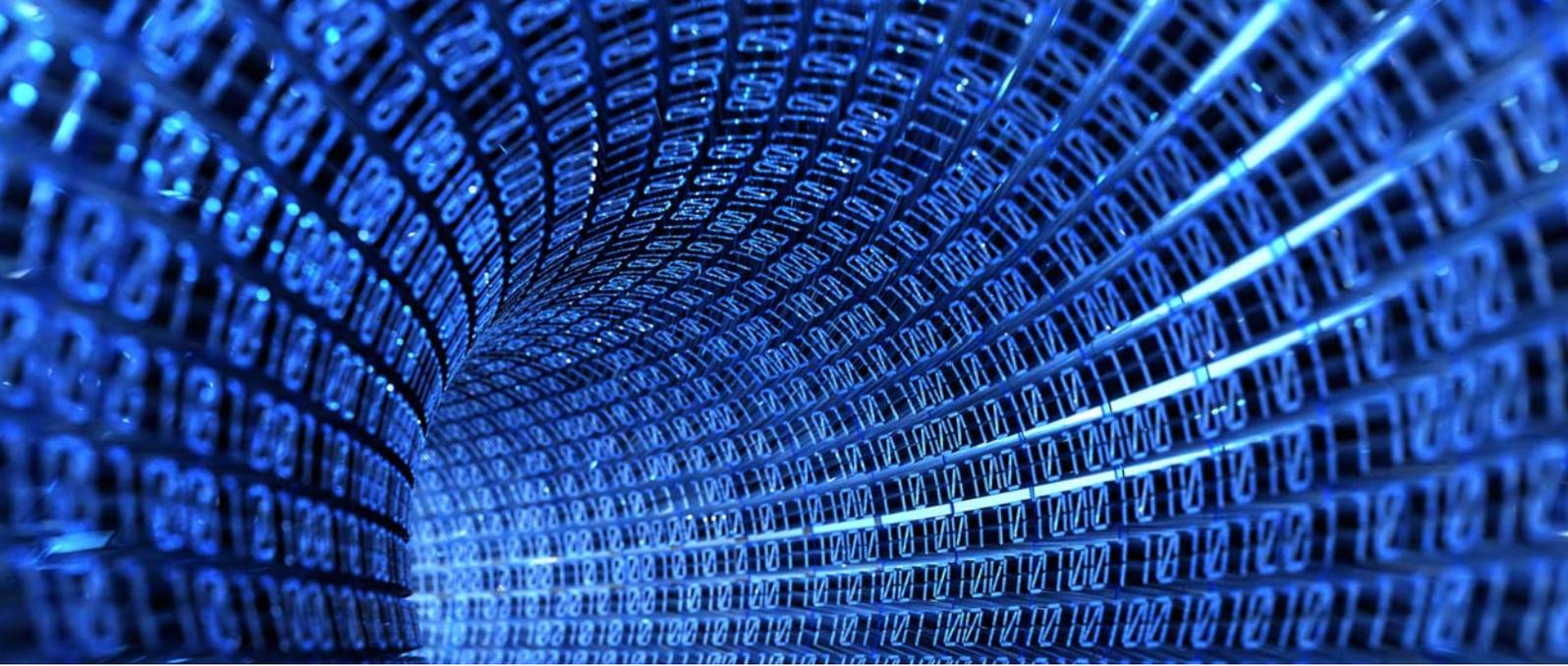
Sound quality and NVH is a good example. To ensure that the driving experience remains audibly pleasurable in, say, an electric vehicle, we can apply Lotus active noise technology, In-Cabin Active Acoustic Tailoring (ICAAT).

Lighter vehicles are cleaner and more efficient. That mantra has always been core to Lotus’ approach

to vehicle engineering and is now more relevant than ever. We are therefore sharpening our focus on the continued evolution of our aluminium and bonding techniques; the rewards of our current R&D in this field will be seen in a variety of production cars launched over the coming years.

We are also investigating ways to make our lightweight structural composites viable for higher-volume applications. Our ECOLITE research is aimed at exploiting the weight and packaging benefits at a competitive cost compared with conventional metal structures.

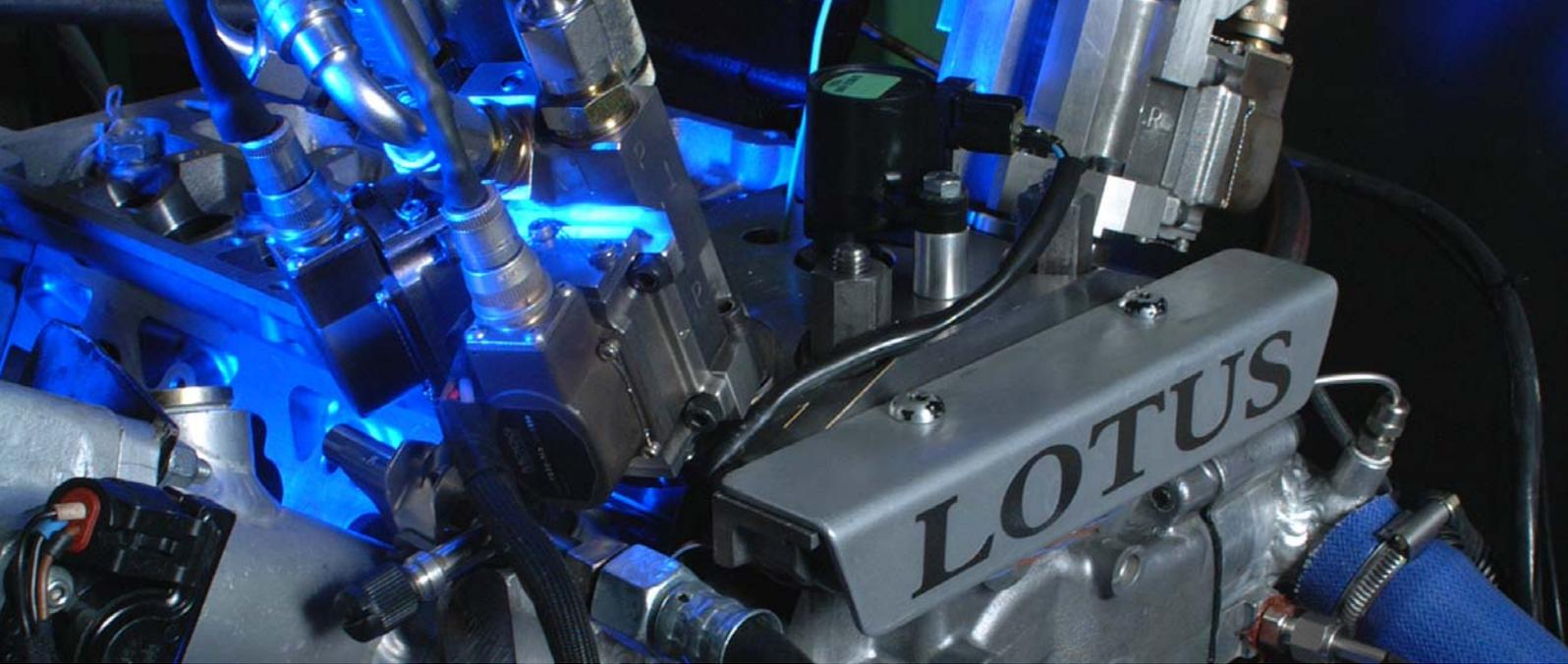
Lotus Engineering



Rising to the challenge – whatever it might be

As a manufacturer of premium cars there is a breadth of knowledge and understanding within Lotus. Although we have a strong focus on driving dynamics, efficient performance and exciting niche vehicles, inevitably there are occasions when clients want our help in other areas. These vary from engine and transmission testing to supplier development and sourcing consultancy in low-cost countries, and from certification and homologation to project leadership.

We are not limited to the automotive arena. There are occasions when clients ask us to apply our engineering expertise and problem-solving capability in other industries.



Lotus Active Valve Train (AVT™) research system

Sharing knowledge with our clients

Lotus engineers operate within an open and client-friendly environment. Many of our clients recognise that this promotes technology transfer and training for their engineers and actively ask for our help to develop their expertise. This can take many forms from formal training courses and lectures through to on-the-job training and project leadership.

Formal training can range from track-based driver tuition that hones skills and improves technical understanding, through to supplier development in low-cost countries.

In other projects Lotus and the client engineers work closely together. This is a highly effective way to

impart our skills and knowledge and to generate long-term relationships.

Some of the clients who request our help have strong, well-educated teams, but with little real world project experience. Here, Lotus can provide key personnel either as technical consultants or programme leaders. Clients then reap the twin benefits of a successfully completed project and the imparting of invaluable experience to their engineers.



The next step

We hope that what you have just read gives you a taste of the talent and passion that sets Lotus Engineering apart.

If you would now like to learn more about how Lotus Engineering can help you, please visit www.groupplotus.com or contact us.

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