



Making **beyond** possible.



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Enabling net zero. Transforming high-speed flight. Pioneering space access.

We are a privately held technology company pioneering space access and sustainable technologies. For over 30 years we have been at the forefront of engineering innovation – including developing SABRE, a revolutionary new class of aerospace propulsion. SABRE enables us to go beyond the limits of flight both within and outside the atmosphere. Making space travel and high-speed flight more efficient, more accessible, more possible.

Developed for SABRE, our proprietary precooler technology is truly transformational. It delivers world-leading heat transfer capabilities across diverse industries to improve performance in motorsport, convert waste heat into renewable electricity and support more sustainable aviation. These revolutionary thermal management solutions have the potential to transform the way we live here on Earth.

Our vision.

Pioneering space access and sustainable technologies to elevate life on Earth.



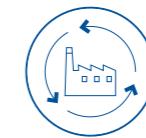
Our passions.

The ideas that drive us and the principles that guide us. This is what we're working to achieve, every single day.



Innovating together

To innovate in partnership with our fellow engineering pioneers, to enable the world's net zero goals.



Revolutionising industry

To revolutionise heat management performance using our space technology, transforming diverse industries.



Making space accessible

To make the dream of everyday space flight come true, boosting the emerging space economy.



Inspiring talent

To inspire a new generation of talent with world-class capabilities, where curiosity is encouraged and differences are celebrated.



Transforming flight

To transform high-speed flight, making the world smaller and the way we traverse it more sustainable.



Empowering customers

To give our customers the power to achieve things they had never believed possible.

A giant leap towards a smaller world. And beyond.

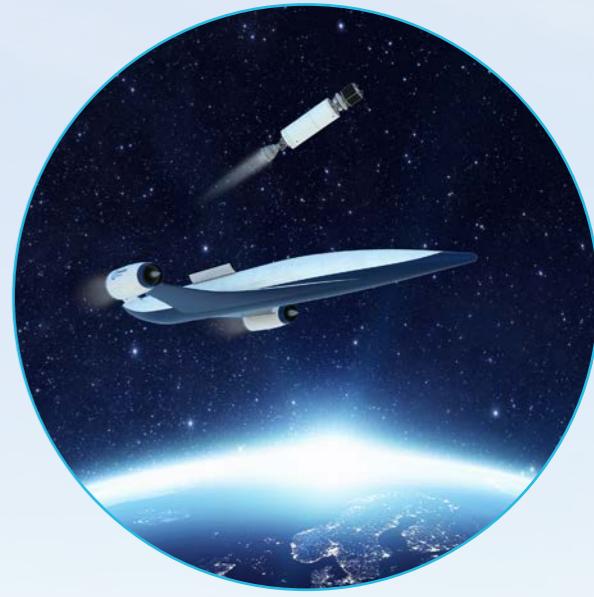
Faster. Further. More efficient. Reaction Engines' advanced propulsion capabilities bring a step change in technology.

Our SABRE and SABRE-derived fast jet technologies can transform space access, empower critical high-speed missions, enable high-speed transport and achieve breakthroughs in sustainability.



Space access.

Our technology eliminates the need for an onboard oxidizer during air-breathing flight – enabling horizontal take-off and landing. This reduces cost, infrastructure, and mission timelines, while increasing responsiveness and system reusability.



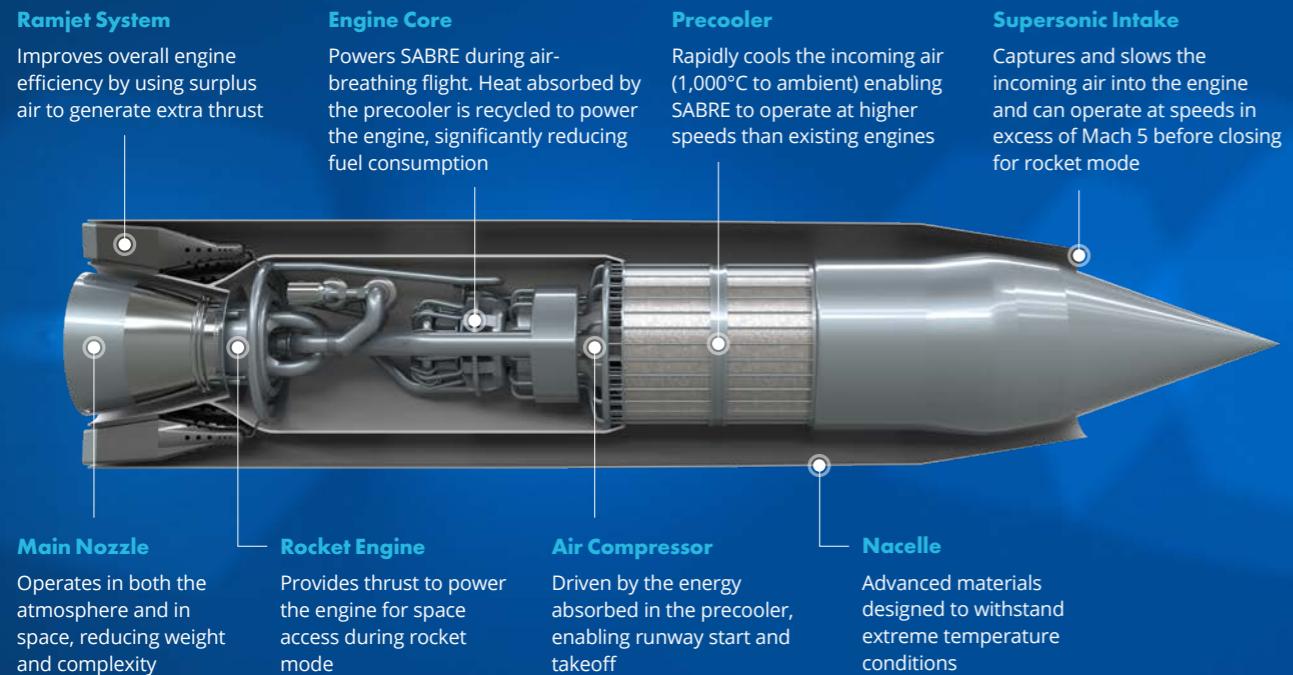
A more sustainable future.

From pioneering advances in hydrogen and ammonia fuels, to our innovative thermal management solutions for fuel cells and batteries – we are committed to achieving a more sustainable world.



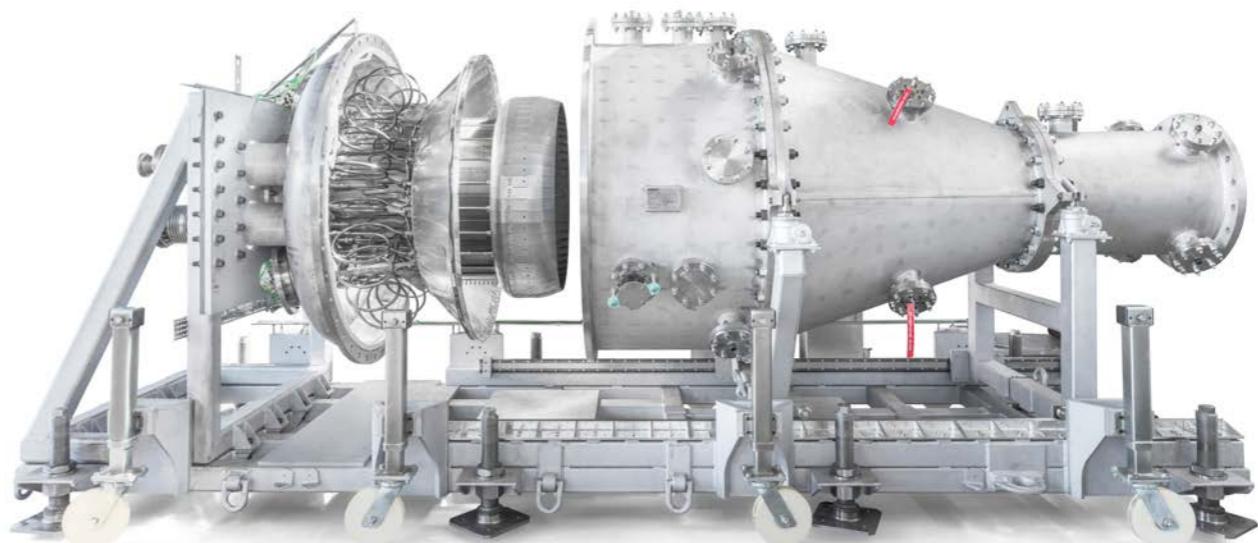
SABRE

The engine that changes everything.



SABRE – Synergetic Air Breathing Rocket Engine – is unique in delivering the fuel efficiency of a jet engine with the power and high-speed ability of a rocket. It can propel an aircraft at five times the speed of sound in the atmosphere and 25 times the speed of sound for space access. This huge range of operation can redefine what's possible in the world of powered flight.

Proven at Mach 5.



In October 2019, our HTX test programme at our Test Facility carried out a ground-level demonstration of the precooler technology at Mach 5 airflow temperatures – proving the potential of this innovation at five times the speed of sound and marking a significant milestone in the development of SABRE.

Our technology. A revolution in jet engine performance.

Our unique technology. Current jet engine systems. Together they create a new generation of high-performance propulsion. Accelerate your high-speed flight capability.



Integrated thermal management.

The need for aircraft thermal management and performance optimisation goes beyond the propulsion system. Leveraging the technologies developed for SABRE, we're making important steps towards overall vehicle energy management.

Jet speed testing.

The majority of engine development testing for our air-breathing propulsion systems can be done on the ground. Crucially, this means we can prove technology with short timelines and at a reduced cost compared to flight testing. A central part of our ability to accelerate the future.



From outer space to your place.

Reaction Engines develops innovative and lightweight thermal management solutions using technology adapted from the ground-breaking SABRE programme. This technology has a wide range of applications across a range of commercial industries.

From improving lap times in motorsport, to converting waste energy into renewable electricity, to supporting sustainable aviation and beyond, Reaction Engines can help your business unlock its full potential.



Aerospace

Our smaller, lighter thermal management technology can dramatically move the aerospace industry forward.

- Lower drag for greater fuel efficiency
- Technologies that enable zero emission aviation
- Can be integrated into existing infrastructures



Motorsport

Replacing multiple components with one ultra-lightweight thermal management solution leads directly to faster lap times.

- Single unit increases design freedom
- Low pressure drop and air mass flow reductions mean less drag
- Greener power through efficient heat rejection



Electric vehicles

Our patented, ultra-lightweight ^{HX}LIFE Foils can be integrated with existing pack designs and manufacturing processes.

- Efficient heat transfer enables faster charging and increased power output
- Increases battery life and reduces the need for active cooling systems
- Compact system increases energy density



Energy

Radically reduces your carbon footprint – turning waste heat into useful energy and reducing operating costs.

- Captures more heat to reuse more thermal energy from the same inputs
- Smaller, lighter units can be retrofitted into existing plants
- Easy to integrate with low installation costs



Countless heat management applications.

We can apply our technology to practically any heat management challenge – from the pinnacle of motorsport to the upper limits of the atmosphere. Using next-generation heat exchangers based on microtube and micro-channel technology, we can help you increase performance and sustainability.

Our pioneering thermal management solutions provide a range of benefits:



Sustainable

Significantly improving efficiency of heat management



Lightweight

Lightweight, space-saving units which enable reduced mass and drag



Ultra-Compact

Allows for improved design flexibility and can be adapted into existing systems



High Performance

Significantly outperforms traditional cooling methods



Reliable

Improved reliability and durability of powertrains and batteries



Effective

Extremely high levels of thermodynamic effectiveness



Durable

Highly durable across temperature ranges and corrosion resistant

Made possible by ground-breaking technologies.

Our thermal management technologies can help you unlock the potential of your business.



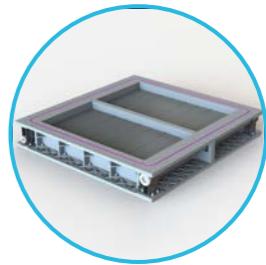
Water-cooled intercoolers

Compact, lightweight and over 99% effective for compressed cathode air cooling in hydrogen fuel cell powertrains and combustion engine charge air cooling.



Low drag radiators

Light and compact radiators that reject large amounts of heat with minimal overall drag. Ideal for heat rejection in motorsport and zero emission aerospace.



Microtube condensers

Ideal for thermal lift systems in electric aviation and rotorcraft. Maximised heat rejection at minimum mass.



Waste heat recovery heat exchangers

Our primary heat exchangers are perfect for recovering waste heat from power generation and industrial applications. Designed for low pressure drops on both fluid streams, they enable retrofit and higher system efficiencies.



EV battery thermal management

Our patented, isothermal battery heat management system for electric vehicles facilitates faster charging and simpler, lighter packs.

OUR FACILITIES

A world-class testing site.

Located at the Colorado Air and Space Port, our Test Facility is uniquely capable of providing megawatt-class, high-temperature air flows for extended durations. Supported by a highly experienced team and state-of-the-art data acquisition systems, with enough space to accommodate even the largest scale partner applications.



 **Test Facility 2**
REACTION ENGINES

Stratospheric innovation. At speed.

Clients and partners can tap into extensive aerospace and high-energy physics experience at our UK headquarters – helping you innovate faster and more effectively.

From precision machining to building bespoke prototypes to the high-specification vacuum brazing of complex precision components – our teams will work side-by-side with you to meet whatever manufacturing challenges you face.



Creative, curious, leaders in their field.

Driven by driven people.

Not everything we do is rocket science – but a lot of it is.

To develop truly innovative technology, you need truly innovative people – which is why our culture matters so much. We have created an environment where every challenge is explored from multiple points of view. Where everyone is receptive to new and different ideas. And where everything is considered possible until it can be proven otherwise.



Next generation technology, created by the next generation.

Our apprentice and graduate training schemes are second to none. Offering an unrivalled opportunity to develop your skills at the cutting edge of science and engineering, our openings include:

Graduate Programme: a 2-year rotational scheme providing access to our future-focused Learning & Development Framework.

Apprenticeship Scheme: an Advanced Level 3 Apprentice Scheme based in different departments, with a final part spent in the department of your choice.

Summer Internship Scheme: multiple opportunities across our business, in engineering, IT, Applied Technologies and business-focused functions.

Contact us to learn more.

Pioneering innovation. Diversity of thought. Unparalleled expertise. If that sounds like something you want to be part of, let's talk.



reactionengines.co.uk/careers/



Making **beyond** possible.

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