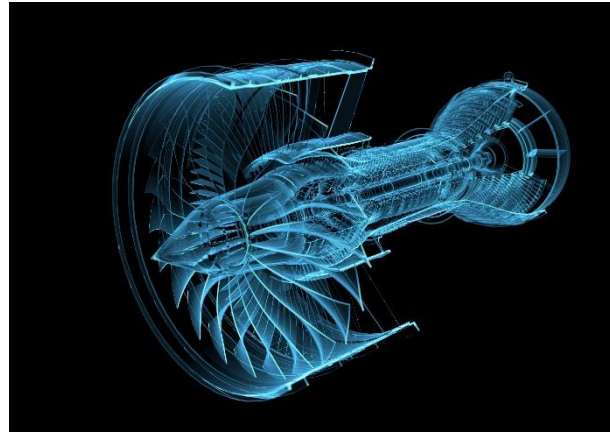
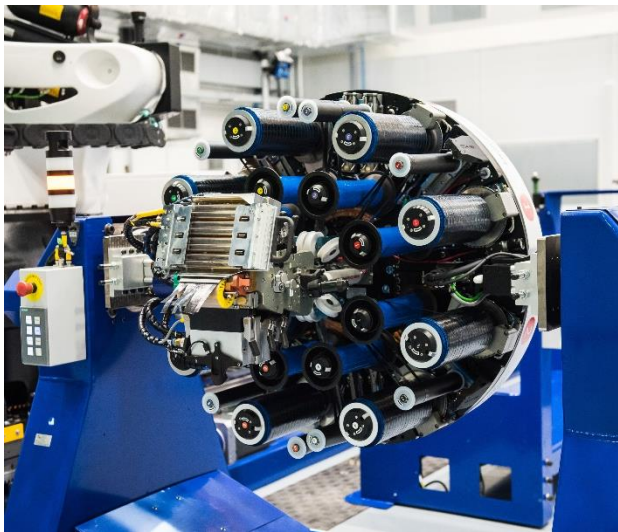
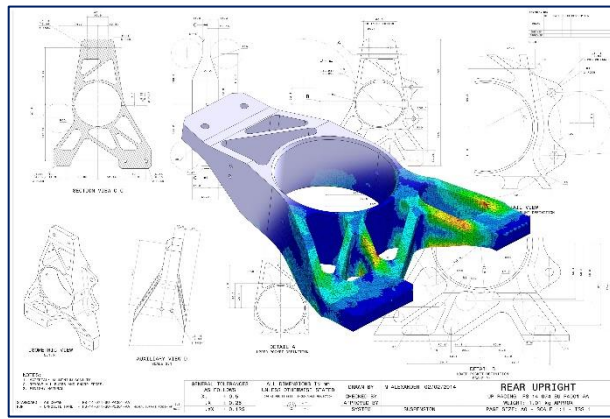




NCC Membership Prospectus 2023-24





Welcome to the National Composites Centre

The National Composites Centre is industry's partner for end-to-end engineering challenges. A world-leading research and development facility, we're driving the future of composites, sustainability, hydrogen and digital engineering.

Using beyond state-of-the-art capabilities, we collaborate with customers to solve complex engineering challenges, from initial product design to end-of-life testing. We continually evolve to best serve industry.

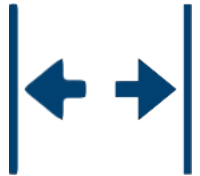
Part of the High Value Manufacturing Catapult, the NCC works across all manufacturing sectors and has forged strong links with aerospace, energy, defence, space, construction, infrastructure, auto, rail, marine and biomedical.

We work with organisations across the board from micro enterprises and SMEs to disrupters, the supply chain and OEMs, providing businesses with a de-risked environment to design, develop, test and scale their ideas and get them to market fast.

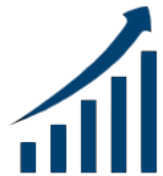




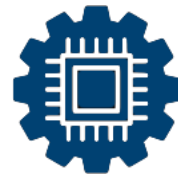
The NCC at a glance



2011
officially opened



£200m
invested in
capabilities



£36.7m
of the £200m
invested in
new capabilities



10
State-of-the-art,
tailor-made
technologies



21,500m²
facility at NCC HQ



Over **400**
composites
engineers



150 engineers
at Bristol
Composites
Institute



2
locations,
NCC HQ in Bristol
and NCC Filton



Over 70
members and
8 major sectors
supported



60+
university
partners



1195
organisations
engaged



63%
of those are
SMEs

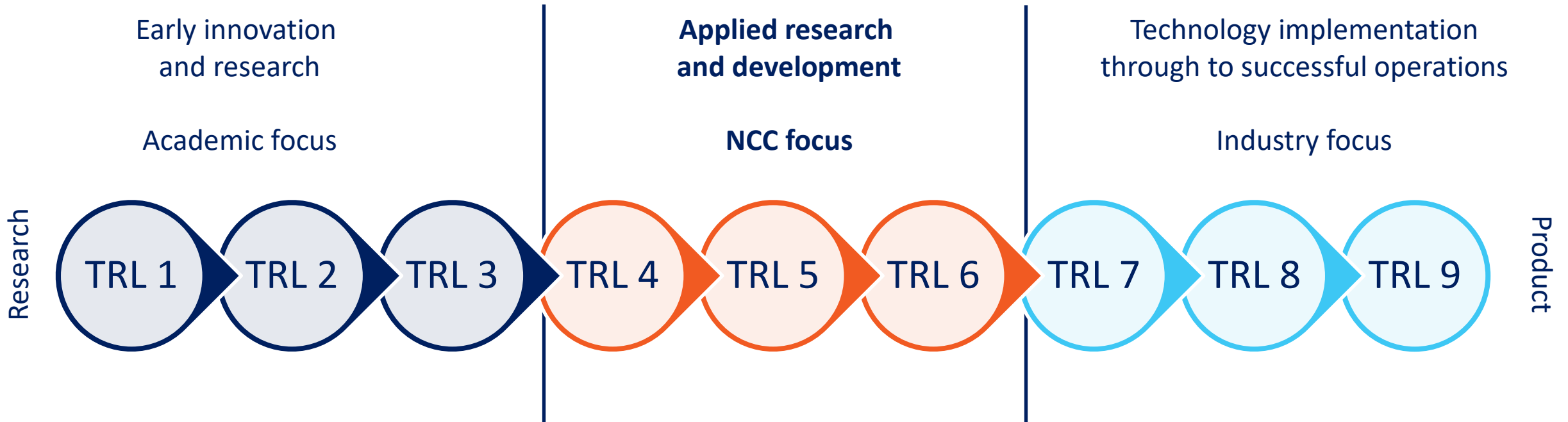




Industrialising innovation for your advantage

The NCC bridges the gap between academia and industry, developing early-stage research and testing it in an industrial setting, ready to be transferred into operation.

A wholly-owned subsidiary of the University of Bristol, we work closely with the Bristol Composites Institute.





Our strategic areas of focus

- National Centre of Excellence for **composite** technologies
 - Critical enabling technology for many sectors
- Using **digital engineering** to transform all aspects of product lifecycle
 - Improve time to market, productivity, in-service
- Taking the lead on **sustainability**
 - All aspects of sustainability: materials, design, reuse, recycle





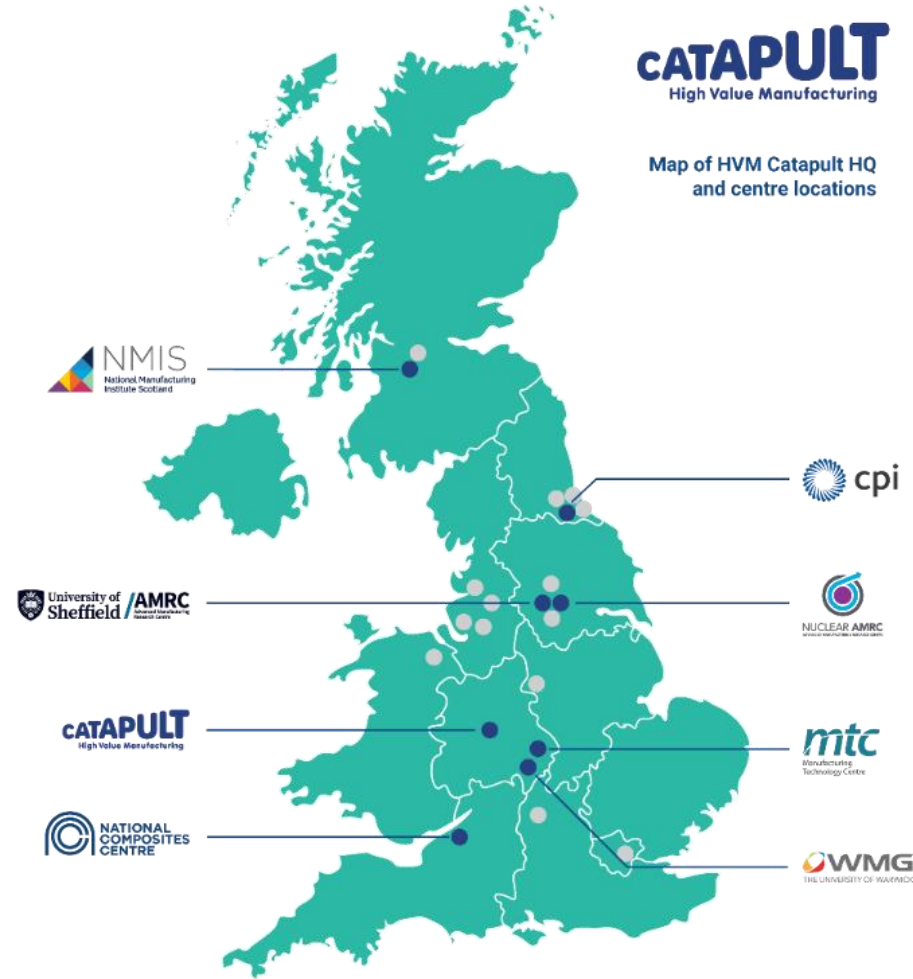
Part of the High Value Manufacturing Catapult



Established by Innovate UK in 2011

Seven centres of industrial innovation across 25 locations working together on the future of manufacturing in the UK.

Over 2,500 manufacturing specialists and £683m+ of state-of-the-art capability



Largest advanced manufacturing capability in Europe

We've worked with more than 25,000 companies

10,000+ projects

3,500+ staff





Delivering industrial transformation

Addressing the three key elements in industrial transformation:



Solving **technology** problems



Providing future **skills**



Developing **supply chains**





How the NCC can help you

End-to-end engineering solutions

From initial design to end-of-life analysis, we can help you develop, adapt and scale-up new and existing processes and products.

Cross-industry networking

You're joining a cross-industry membership, with regular opportunities to network, share ideas and challenges, and how we can work together to solve them.

Help us help you

As our closest customers, Members help steer our research and development activities to have the biggest impact for industry.

World-leading capability

Access to our 'beyond' state-of-the-art technology, world-leading engineering capabilities, and specialist engineers.

Understanding your challenges

Your account manager will work with you to understand your business and how best the NCC can help you.

Workforce Development

Keep your workforce up to speed with the latest in techniques and knowledge with our range of open access training courses.





Membership tiers and benefits overview

Membership Tier	Tier 1	Tier 2	SME
Cost per year	£180,000	£30,000 (in kind)	£2,500
Minimum contract length	Three years	One year	One year
Core programme participant	✓		
Core programme optional buy-in		✓	
Membership Board position	✓		
Member Direct projects	✓	✓	
Bookable hot desks (subject to availability)	✓	✓	✓
Bookable Meeting Rooms (subject to availability)	✓	✓	✓
Membership Forum events	✓	✓	✓
Research Committee meetings	✓	✓	
Training course places per year	5	3	3
Logo display on NCC website	✓	✓	✓
Social media announcement on joining	✓	✓	✓





NCC Membership Levels



Tier 1 Membership

Minimum £180,000 per year, three-year contract

Tier 1 Members commit to a three-year partnership with the NCC. This commitment enables the company to access the technology and expertise they need to support what we call “Member Directed” projects. They also partner in a collaborative R&D project with at least one other Tier 1 Member.

Benefits include:

Access to over **£1million worth of research** via the Core Programme

Directed research to value of membership

Access to **NCC facilities** for private venture work

Unlimited attendance at **Members' Forums**

Opportunity to **shape the future direction** of the NCC via representation on the Membership Board and Research Committee

Unlimited bookable desks and meeting rooms (up to 10 people)* (Can be pre-booked for the year)

Access to the **NCC network** including leading OEMs, material and equipment suppliers

Up to **five places** on NCC open training courses

Logo on NCC website

*Subject to availability





Tier 2 Membership

Minimum £30,000 per year*, one-year contract

Tier 2 Members commit to a minimum one-year partnership with the NCC. This commitment enables the company to access the technology and expertise they need to support what we call “Member Directed” projects. They are also able to join the NCC Core Programme, and are encouraged to conduct collaborative projects with other members.

Benefits include:

Optional buy-in to the **NCC Core Programme** and right to negotiate IP license

Directed research to value of membership

Access to the **NCC network** including leading OEMs, material and equipment suppliers

Opportunity to **shape the future direction** of the NCC via the Research Committee

Access to **NCC facilities** for private venture work

Unlimited bookable desks and meeting rooms at the NCC (up to 10 people)**

Logo displayed on NCC website

Up to **three places** on NCC open training courses

Unlimited attendance at exclusive **Members' Forums**

* Monetary investment or goods/service in-kind

**Subject to availability





SME Affiliate

£2,500, one-year contract

SME Affiliate Members sign up to a year-long affiliation which is designed to provide affordable access to the NCC capabilities, expertise, training and networks, making composite materials research and development as accessible as possible to all levels of industry.

Benefits include:

Exclusive access to **networking events** and knowledge sharing sessions that address industry challenges

Bookable hot desk at the NCC'S HQ in Bristol, providing on-site access to advice from the NCC's own specialist engineers

Training on the NCC's **technology and software**

Exposure to other members and industry via the NCC's communication channels

Up to **three places** on NCC open training courses

Logo displayed on NCC website

*Subject to availability





NCC Core Programme

Supporting industry-led fundamental research



The Core Programme

The Core Programme is an applied research programme that delivers pre-competitive technology development and insight. It is steered by the NCC's Tier 1 Members, providing you with a technology pipeline for future competitiveness.

Driven by Members, for Members

Tier 1 Members suggest, shape and direct the projects, meaning the research is beneficial to your business

Yearly research outputs over £1.3million

Tier 1 Members access all IP generated across Core Programme, not just the projects you buy in to

Cross-industry collaboration

Projects can involve multiple Members, and non-Members can be invited to join specific projects





The Core Programme: How it Works

Each Tier 1 Member invests £180k in their NCC Membership.

The most cost-effective return on that is through the Core programme, which enables you to leverage the investment of others. There are four kinds of project.

Joint Members project

Members invest in projects in collaboration with fellow NCC Members.

Joint Industry Partnership

Members invest in projects in collaboration with organisations who aren't NCC Members.

Single Member project

One Member invests, and the NCC may also invest, in the project.

Members and NCC project

Multiple Members collaborate, with the NCC also investing in the project.

- The NCC may invest in projects, further increasing the value of the research
- Members receive the research outputs for all projects, not just those you choose to invest in
- Tier 2 Members and non-members receive only the IP of the project they are involved in





How the Core Programme helps our Members

Joint Members project: Dry Fibre AFP

- Three-year Core programme 2015-2018
- Provided technical foundation for depositing bound dry fibre aerostructures with AFP
- Commercial material assessment, key process parameters, feasible geometry etc.
- **Directly used in current large aerostructures development programmes**

Members and NCC project: CMC-AFP

- Two-year Core programme 2021-2023+
- **Started aerospace qualification path for novel CMC material to reduce cost associated with waste**

Joint Industry Partnership: SUSWind

- Ongoing programme to develop future commercial model for sustainable wind energy structures

Single Member project: Bondline Fracture Mechanics

- Assessing cost-effective and fast scientifically-grounded methods for predicting the performance of bonded joints





Core Programme Benefits

Maximum **topic** flexibility

Projects are proposed by Tier 1 Members, and initial ideas submitted by NCC and University of Bristol specialists are also shared for consideration. Members then choose which projects to invest in.

Maximum **format** flexibility

Multi-year projects can be planned, providing the opportunity for complex subjects to be interrogated, with fail-fast break points included as required.

Maximum **output** flexibility

Tier 1 Members have access to the IP from all Core projects each year, for them and their supply chains to exploit.

Maximum **partner** flexibility

Tier 2 Members and other, non-Member organisations in the supply chain can co-invest and directly secure knowledge and knowhow.





Core Research Themes 2022-2023



Hydrogen

Cryogenic
Composite Tanks

Hydrogen
Permeability



Harsh
Environments

Fire-Resistant
Composites

CMC-AFP

High-Temperature,
Low-Dielectric
Composites



Sustainability

Design for
Sustainability

Recycling Composite
Manufacturing Waste

Towards Zero
Waste Infusions

Effective Recycling of
EoL Composites



Explorative

Enhanced Manufacture
using Immersive
Technologies

Continuous Fibre
Composites AM

Automated Deposition
of Recycled Prepreg
Tapes

Bondline Fracture
Mechanics





Training with the NCC



Training at the NCC

We offer training designed to upskill and reskill teams and individuals across every sector to build capabilities in a range of disciplines.

Tier 1 Member:

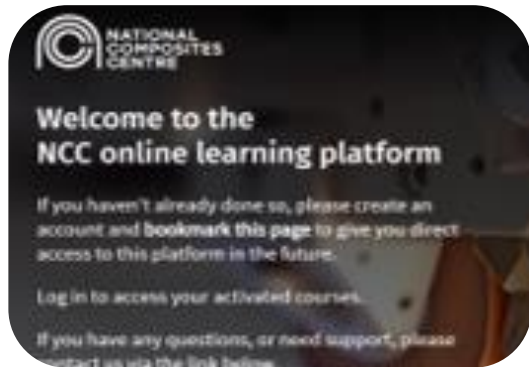
- Five places per year
- Unlimited places on online Introduction to Composites
- Unlimited places on Hydrogen Awareness

Tier 2 Member:

- Three places per year
- Unlimited places on online Introduction to Composites
- Unlimited places on Hydrogen Awareness

SME Affiliate Member:

- Three places per year
- Unlimited places on online Introduction to Composites
- Unlimited places on Hydrogen Awareness



Online self-paced eLearning



Virtual Classrooms



In person courses at the NCC, Bristol





Training at the NCC

Some recent feedback from Members who have attended one of our courses:

"I recently attended the Introduction to Manual Prepreg Techniques and the Intermediate Manual Prepreg Techniques courses offered by NCC, and it was an incredibly valuable experience. I had a lack of awareness in this manufacturing technique, which was causing gaps in my knowledge. The course provided me with invaluable insight into Prepreg lay-up, and was highly relevant to my work."

"I feel up-skilled in the subject area, and I would highly recommend NCC for composite training. Their courses are well-structured, informative, and delivered by experts in the field."

"The course met my individual needs, and I was able to apply my learnings immediately. I now understand why issues my department faced in the past with suppliers occurred, and it has helped me navigate those challenges more effectively."

"Not only is the training a value-added service that complements the membership, but I was also extremely satisfied with the overall NCC experience. The learning objectives set out at the start of both courses were met, and I came away from the training feeling confident and knowledgeable."





Get in touch

If you have any further questions about a Membership at the NCC, please get in touch – we'd love to hear from you.



membership@nccuk.com



01173 707600





Case studies



Current project: Optimising wing aerodynamics with composites for net zero aviation

The Airbus 'eXtra Performance Wing' demonstrator programme focuses on accelerating and validating technologies that will improve and optimise wing aerodynamics and performance for any size of wing, helping to decarbonise the aviation industry.

The NCC is working with Airbus on the design of the demonstrator wing and the manufacture of primary components of the 'wing box' structure to host the new active control technologies. The wing box manufacturing comprises the upper and lower skin cover, and the leading edge and trailing edge spars.

The NCC team will gain unique experience in the design and manufacture of 'flying parts' process controls, a new level of rigour and knowledge that can be shared with the UK composites supply chain, opening new opportunities for non-aerospace composites companies to gain access to the aerospace market, as well as the wider UK aerospace sector.

Developing the eXtra Performance Wing in Britain will help grow the supply chain skills that will help keep the UK a global centre of excellence for aircraft wing manufacture.



© AIRBUS S.A.S. 2021 - computer rendering by FIXION - photo by dreamstime.com - MMS - 2021

AIRBUS





Case study: Bigger structure. Fewer parts. Smaller cost

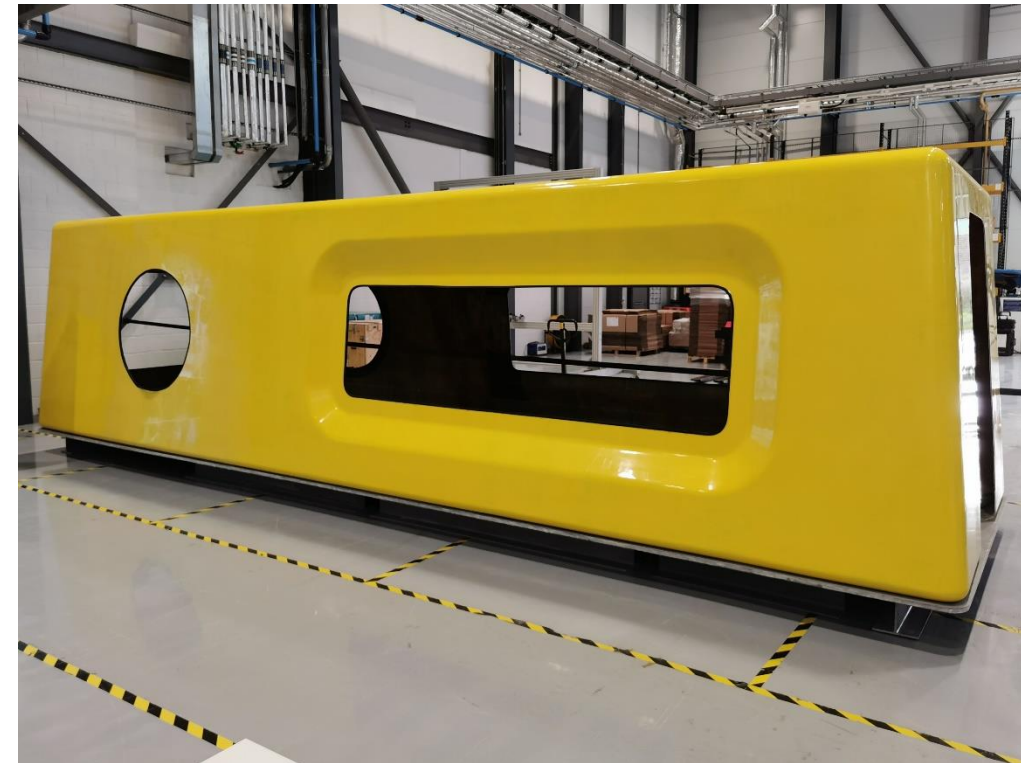
To show the art of the possible, a specialist team of engineers at the NCC developed a large modular composite structure demonstrator.

The team's aim: to showcase technologies that achieved lower-cost manufacturing and reduced part count and cost of operation for large structures in safety-critical applications, when compared with traditional metallic solutions. To ensure industrial benefit, the team prioritised solutions for large composite components that could be readily assembled, making sure low-cost tooling and processes were used.

At 8m long, 2.5m wide, and 2m high, the demonstrator incorporates a novel combination of technologies including resin infusion and dry lay-up to offer a fresh perspective on a potential future direction for structures in the energy and construction sectors.

As well as enhancing and consolidating NCC's own knowledge and technical expertise in approaching large composite structures, this project has illustrated a way to manufacture large, lighter, more damage-tolerant next-generation components at lower cost.

The NCC is now working with customers to develop and exploit the capability and technology proven by this project, particularly in offshore and subsea environments.





Case Study: A significant milestone in the development of the UK's hydrogen capability

The NCC, along with British SME partners B&M Longworth Ltd and Cygnet Tekimp, successfully reclaimed continuous composite carbon fibres from a pressure vessel and re-used them to manufacture a new pressure vessel.

An award-winning innovation, this is the first time this process has been achieved in the UK and represents a significant milestone in the development of Britain's hydrogen capability.

The fibre recovery and recycling project forms part of the NCC's Hydrogen programme, developing and sharing the technical knowledge, cross-sector composite expertise and state of the art technology that businesses need to achieve their hydrogen ambitions.

As part of this programme, National Composite Centre engineers have worked to refine composite pressure vessel designs, producing detailed design and analysis to minimise waste and trial the tools and manufacturing processes industry will use to reclaim and recycle continuous carbon fibres.

They have also delivered composite design specification for cryogenic pressure vessels and are working on a certification pathway for composite pressure pipes, including those to be used offshore.





Case Study: 12-hour rapid turnaround, from quote to customer delivery

LMAT Ltd – a University of Bristol spin-out - leveraged their SME Affiliate status for urgent support from the NCC to cut a moulded panel into smaller samples to enable them to complete further work for customer.

NCC Connect – the NCC’s dedicated SME support team - worked quickly with the Filton-based enterprise to understand their exact requirements, as well as propose a viable and affordable solution that met LMAT’s tight timeline: a material laboratory saw to grip and machine ten precise 25mm-wide specimens to a specific diagram.

As a result, from quote to specimen collection, NCC Connect facilitated a rapid 12-work hour turnaround – significantly quicker than if LMAT had approached a commercial material laboratory.

Tomasz Garstka, CEO of LMAT, said: ‘Customers opting for a small business service instead of a larger organisation typically have higher expectations on service delivery, and a zero tolerance for delays. As an SME Affiliate member, I find NCC Connect’s familiarity with the work that we do translates to a much-needed shorthand when communicating our specific requirements. This contributes to a confidence that the end result by the NCC will always be delivered right the first time, and in turn, helps us deliver reliably on our own customer promise.’

