MADE IN MANCHESTER: GRAPHENE AND 2D MATERIALS

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MANCHESTER: DRIVING MATERIALS INNOVATION

Graphene, the world's first 2D material, was first isolated at the University of Manchester in 2004. Consisting of a single layer of carbon atoms it has been nicknamed the “wonder material” thanks to its impressive properties.

Graphene's properties
- 200 times stronger than steel
- World’s most conductive material
- Flexible
- Transparent
- Impermeable

Since graphene's isolation a family of 2D materials have been established; each material offering a unique range of properties.

Graphene has captured the attention of scientists, researchers and industry worldwide with its potential only limited by imagination.

Since Graphene's isolation, Manchester has been at the forefront of research into 2D materials adding to an already established advanced materials ecosystem. The city is home to:

- Two world leading centres for graphene research
- The UK's National Institute for Materials Science Research and Innovation – The Henry Royce Institute
- The BP International Centre for Advanced Materials
- The North West Composites Centre
- The University of Manchester Aerospace Research Institute
- The UK's National Composites Certification and Evaluation Facility
- Four universities

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Talent
Manchester is home to one of the largest student bodies in Europe with a student population of over 100,000 across the city’s four universities. 33,000 students graduate each year of which 40% remain in the region. Manchester is home to the largest School of Materials Science in Europe futureproofing talent supply by training the next generation of engineers and researchers. There are also a further 19 universities within an hour’s drive time of the city.

A thriving cluster of companies
A wealth of international organisations have recognised Manchester’s advanced materials strengths with Siemens, Hitachi, Nexperia, BASF, Magnesium Elektron and Nanoco Technologies all establishing a base here. The city is also home to global brands in other industries including life sciences, ICT, energy, and financial and professional services allowing materials businesses to collaborate across sectors.

Connectivity
Manchester is connected to global manufacturing hubs by Manchester Airport which flies directly to over 200 destinations. London is less than two hours away by train and Manchester’s central location and excellent motorway network allows easy access to the rest of the UK.

Liveability
Youthful, diverse, energetic and bursting with character; Manchester is one of the most exciting places to live, where everybody and anybody is warmly welcomed. One of the world’s top 50 places to live, the city centre offers a unique cultural offering whilst the surrounding boroughs offer beautiful green spaces, and picturesque market towns.
MANCHESTER: GRAPHENE CITY

The Market Opportunity

The estimated global graphene materials market will be more than £300 million by 2024. While graphene’s possible uses are endless, research is currently focusing on:

- **Energy**
  - Batteries
  - Supercapacitors
  - Storing wind and solar power

- **Composites and coatings**
  - Construction
  - Plastics
  - Sport equipment
  - Mining
  - Packaging

- **Lightweight materials**
  - Aerospace
  - Automotive
  - Rail
  - Marine

- **Membranes**
  - Graphene filtration
  - Graphene coatings

- **Inks, formulations, coatings**
  - Non-rust paint
  - Weatherproofing
  - Sensors

- **Other research areas**
  - Graphene production
  - Characterisation
  - Bio-medical
  - Electronics

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Manchester is creating an innovation ecosystem where scientists, manufacturers, engineers, innovators and industrialists can collaborate. At the core of ecosystem is:

The National Graphene Institute (NGI)
£61 million has been invested into the NGI at the University of Manchester which is focused on research into the applications of graphene. Over 80 companies are already working with over 300 researchers shaping the material’s future development.
graphene.manchester.ac.uk/about/ngi

Graphene Engineering Innovation Centre (GEIC)
This centre focusses on industry-led commercialisation of graphene enhanced products in partnership with academics. Industry partners can benefit from the ability to rapidly develop, test, and scale up graphene and 2D material applications using the centre’s composite, energy, membrane and printing laboratories.
graphene.manchester.ac.uk/about/geic

The Henry Royce Institute
The Institute is the UK’s National Institute for Materials Science Research and Innovation. The Institute is at the centre of a network of partners including the universities of Oxford, Cambridge, Imperial College London and Leeds. Research specialisms will include 2D materials, advanced metals processing and atoms to devices. The Institute gives businesses access to state of the art equipment and facilities and is continuing to grow available assets with its flagship building opening in 2019.
royce.ac.uk
Alongside the various research centres working in partnership with industry, Manchester is home to four universities. All of the universities are actively engaged in developing partnerships with organisations globally.

Manchester’s four universities build on 2D materials with research strengths across a range of specialisms, including: coatings, organic polymers and semiconductor materials.

University of Manchester

High research power – ranking 28th globally
Where graphene was isolated
Home to two world leading graphene research centres
£248m investment in live research projects
Over 300 researchers working on 2D materials including graphene

manchester.ac.uk
Manchester is a city committed to supporting new investors and helping existing companies grow.

Since 1996, MIDAS, Manchester’s inward investment agency, has helped hundreds of businesses to locate and expand in Greater Manchester.

Our specialist business development team can help you and your business build your investment case, find the ideal commercial property, source the right staff and introduce you to networks on the ground to help your business grow. We have a reputation for understanding diverse business needs and helping to remove barriers for companies looking to invest in the area.

All of our services are free and confidential for companies from SMEs to global firms as well as location consultants.

Our local expertise and networks mean it’s easy for us to introduce you to the right suppliers, agencies and educational establishments. This essential support will save you time, money and effort leading to an efficient and successful move.

Contact MIDAS to see how Manchester can support your future innovation.

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HELLO Manchester

HELLO Manchester is a service that offers free or discounted office space, professional services as well as preferential hotel and restaurant rates to overseas investors. This ‘soft landing’ initiative enables companies to establish a foothold in Europe’s top city for business competitiveness with minimal risk and cost. All of this is underpinned by a vibrant quality of life and complimentary business support from MIDAS, Manchester’s Inward Investment Agency.

To find out more contact: info@midas.org.uk