

CARBON/CARBON COMPOSITES
AND PRODUCTS

Specialist C/C
Composites for
High-Temperature
Applications and
Heat-Treatment.

Advanced Carbon/Carbon Composites manufactured by Neftec.

- Next generation C/C Composites and products
- Exceptional material and manufacturing knowledge
- Class leading C/C composites helping reduced customer's overheads
- Delivering consistent high-quality products, services and support
- Broad-based solutions

Your Next Generation Material Partner

Next generation C/C Composites giving our customers the competitive edge

Neftec's experience and technological innovation in Carbon/Carbon Composites allows us to provide our customers with a range of solutions for their high-temperature applications.

Next generation thinking is Neftec's ethos and this can be seen in the Carbon/Carbon Composites we manufacture and our ground-breaking technology behind it. We pride ourselves not just on providing innovative and new Carbon/Carbon (C/C) Composites. But also the way we work with our customers. Our priority is to supply solutions to our customers which help them excel in their specified field. Working with Neftec can offer such advantages due to our diverse way of thinking and adaptable C/C composite technology. A tried and tested combination that helps our customers productivity and growth.

Neftec has a long history in the research, development and manufacturing of short-fibre Carbon/Carbon composites. With our manufacturing facilities based in the heart of Japan, Neftec is striving to produce global leading short-fibre C/C composite materials and products that offer high performance while giving exceptional economical advantages to our customers.

Our history can be traced back to the early 1980s where Neftec's Chief Engineer and President worked with major petroleum companies developing C/C composites for various applications. While the development of Neftec's short-fibre composite originates from his work with friction applications for motorsport and aerospace industries. Today Neftec's material have matured into a material that is adaptable for many industries. It is accepted globally for its high-quality, strength and durability. While Neftec is recognised as a company looking to lead the way with low cost, high performing C/C Composites.

- Neftec is accepted globally for its high-quality, strength and durable C/C.
- A dynamic ability to adapt and keep ahead of our target markets.
- Tailored solutions to our customers.

Advanced C/C Composites

Features of Neftec's C/C Composites

Carbon fibre reinforced carbon composites, which commonly referred to as either Carbon/Carbon Composites, CFC or C/C is an advanced material that's made of thin carbon fibres and reinforced by a carbon matrix binder creating a compound or composite of highly stable heat-resistant material.

Neftec's short-fibre C/C Composites have unique and superior properties, these include; high strength, lightweight and exceptional heat resistance. This makes them suitable for an array of fields including, vacuum heat-treatment, electronics production, energy and renewable, automotive and aerospace.

■ High Mechanical Strength and High Inter-Laminar Shear Strength

Neftec's short-fibre offers exceptionally high inter-laminar strength compared to standard 2D long-fibre C/C and graphites. High ILS strength is the a key point to overall strength in C/C and we believe should be a priority focus when choosing a C/C material.

Higher the ILSS, lower the chances are for de-lamination. The leading cause of C/C failure.

■ Superior heat-resistance

When compared to 2D long-fibre composites. Neftec's composites in the same environment can exhibit far greater resilience over prolonged periods of time. Our C/C Composites can withstand temperatures within a vacuum of up to 2500°C

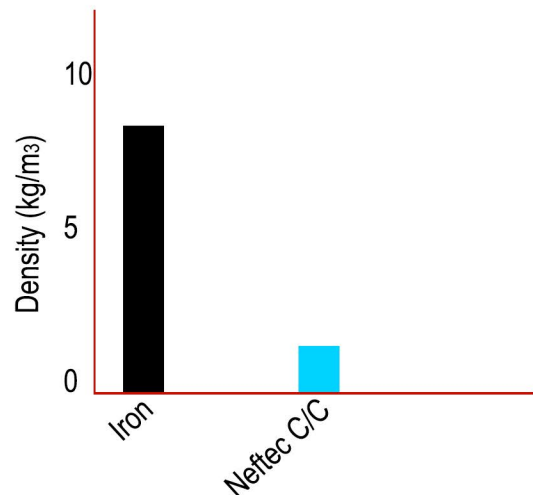
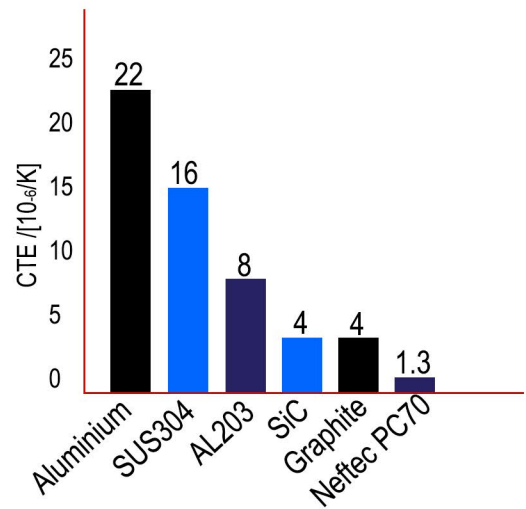
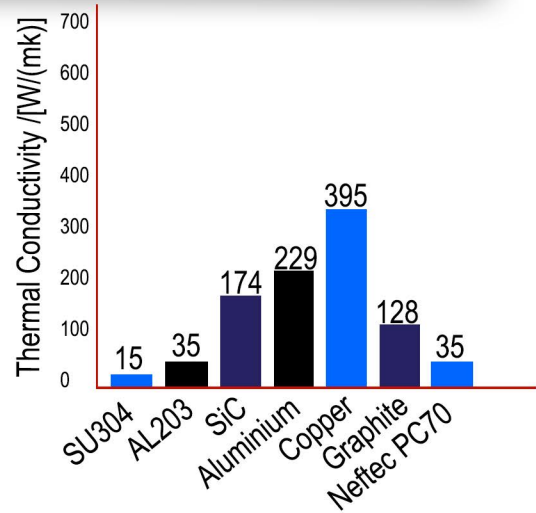
■ Light-weight and long life

Our C/C exhibits exceptional low weight and an average density of 1.7 g/cm³. Making it ideal for easy handling, lightweight fixtures, furnace construction. All of which aids increased productivity.

While the class leading density provides a long lasting life-span and excellent overall strength.

■ High Thermal conductivity

Neftec's C/C offers excellent thermal conductivity characteristics, when partnered with excellent thermal expansion, this makes Neftec's C/C Composite much more resilient to thermal shocks and contributes to further energy savings to the user.



Shown; PC70 - Neftec's short-fibre C/C Composite.

+ Premium Carbon Series

High strength, defined quality, efficient.

Neftec understands the needs of our customers and the industries we supply. And this is why we offer several different types of C/C composites in order to cover a large area of heat-treatment and high temperature applications.

Customers needs can also change or require something more specific to an application. And with this in mind we can offer a bespoke composites based on the present grades we offer.

This allows our C/C composites to cover an even broader range of applications by utilising our PM technology we can develop a unique PC/WL Composite that is tailored to a customer's specific requirements.

- Specific technical properties can be changed to suit the customers requirements. For example higher density.
- We offer the thickest C/C composites blocks on the market.
- Affordable options for insulation protection
- Broad range of sizes offered to cover a wide range of applications

■ Technical Properties

Material Grade			PC70	PC70H	WL60	IC50
Fiber Direction / Length			Random / Short	Random / Short	Unidirectional 0°/90° / Long	Random / Short
Bulk Density		g/cm ³	1.7	1.7+	1.6	1.5
Flexural Strength		MPa	200	TBA	100	100
Tensile Strength		MPa	120	TBA	200	NA
Youngs Modulus		Gpa	45	TBA	65	NA
Compressive Strength		MPa	120	200+	NA	NA
Interlaminar Shear Strength		MPa	19	19+	11	10
Coefficient of Thermal Expansion (RT-1300C)		10 ⁻⁶ /°C	1.3	TBA	1.1	1.1
	⊥		10	TBA	9	9
Thermal Conductivity		W/m · K	35	35	33	35
	⊥		12	12	10	12
Specific Heat	20C	J/Kg · K	720	720	TBA	720
Electrical Resistivity		μΩcm	2800	TBA	2800	NA
Charpy Impact Strength		KJ/m ²	20	20	TBA	TBA
Shore Hardness			75	TBA	TBA	NA
Temperature rating		°C	2000	2000*	2000	2000

■ Available sizes

		PC70	PC70H	WL60	IC50
Standard production dimensions	Standard Stocked Thicknesses	Grade size and thickness availability			
420 x 2000 or 420 x 1000	31mm to 120-130mm	Yes	Yes	NA	NA
1000 x 1000	0.6mm to 30mm	Yes	Yes	Yes - 2mm to 6mm only	Yes 0.6/0.8mm to 5mm
1120 x 1120	1.2mm to 20mm	Yes	Yes	NA	NA
1270 x 1270	1.2 mm to 30mm	Yes	Yes	NA	NA
2000 x 1000	0.6mm to 30mm	Yes	Yes	Yes - 2mm to 8mm only	Yes 0.6/0.8mm to 5mm
Special order sizes					
250 x 2200	75mm to 120-130mm	Yes	NA	NA	NA
1000 x 500	30mm to 120-130mm	Yes	NA	NA	Yes
1000 x 1000	31mm to 50mm	Yes	NA	NA	NA
1000 x 2000	28mm to 31mm	Yes	NA	Yes - 2mm to 8mm only	Yes 0.6/0.8mm to 5mm

*Please note that material property data is accurate at the time of testing but is not guaranteed. Data measured is taken from batches and the property data is from the overall average. The properties could vary.

+ Core Industries

Carbon/Carbon Composites supporting modern industries.

Carbon/Carbon composites are becoming ever increasingly part of many modern Heat-treatment industries. Rapidly replacing traditional materials like Graphites and High-temperature alloys. We are seeing an increasing demand and adoption by these industries due to their understanding of C/C Composites and what the potential they offer.

Industries switching to C/C composites see a significant increase production output and further reduction to their overheads. Our continued efforts to push the technological boundaries of our materials allows us to offer multi-functional C/C products that are suited for variety of customers and specialist fields.

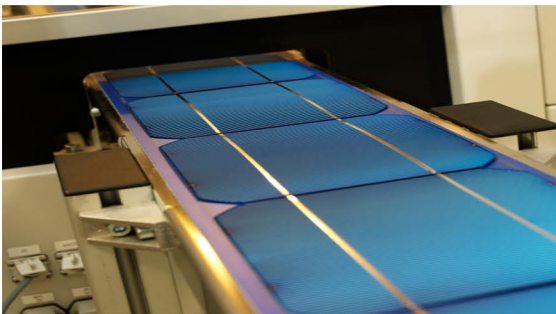
You will find our C/C Composite products in many modern industries, from Photovoltaic and Electronic production to high-temperature vacuum furnaces for heat-treatment as well as aerospace propulsion systems.

High-Temperature Technology

Industries that work in High-Temperature and Heat-Treatment require minimum downtime and maximum output.

You can rely on Neftec to supply C/C components for the field of high temperature applications, whether it be in the glass industry or furnace construction.

- Furnace construction
- Glass industry
- Commercial Heat-treatment, brazing, sintering
- Tool and Die
- Automotive
- Aerospace



Friction Technology

We have a long history in producing Carbon/Carbon friction technology and supply many types of transportation technology. This includes Formula 1 clutches, Rail Pantographs to aviation braking systems. Our Carbon/Carbon exhibits excellent longevity to significant weight savings thus reducing energy consumption.

- Aviation braking
- Automotive braking and clutch
- Rail
- Industrial braking



Energy Technology

Clean energy sources are a key focus in today's modern world and providing clean energy that is affordable and accessible is of high importance.

At Neftec we are driven to helping to reduce costs and increase performance for a wide range of energy industries.

- Solar Cell production
- Silicon crystalline growing
- PECVD
- Nuclear industry



Specialist Technology

There are industries that require high-temperature materials that are very specific to their needs. We offer unique services from fully bespoke Carbon/Carbon composites to thermal coatings.

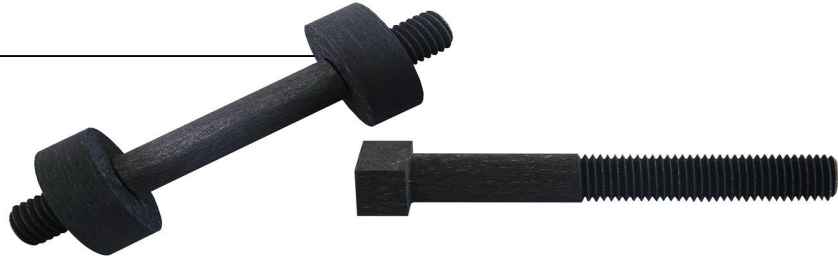
- Robotics
- Oil and Gas
- Magnetic production
- Medical
- Electronics
- Fuel Cells

+ Carbon/Carbon Products

Manufacturing a range of products for a broad range of industry.

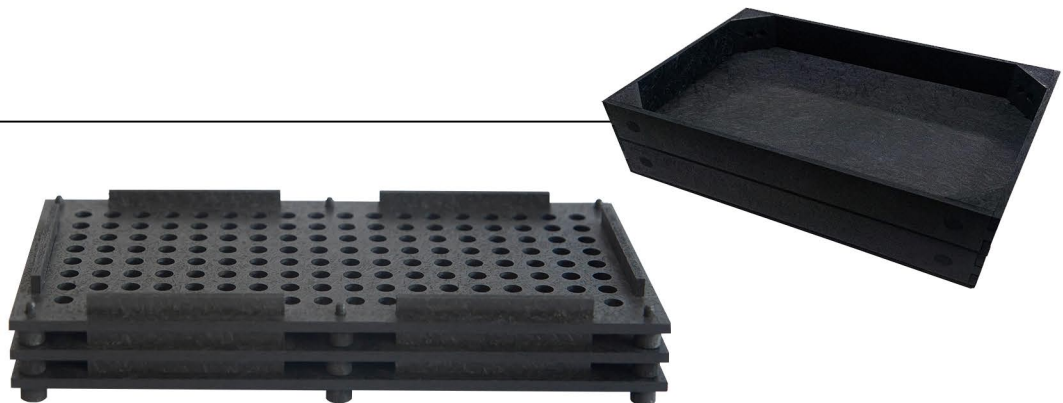
■ C/C Fasteners

- C/C Threaded bar
- C/C Plain rod
- C/C Screws
- C/C Nuts and bolts
- C/C Washers



■ C/C Fixtures

- C/C Multi tier Grids
- C/C Trays
- C/C Shelves
- C/C Baskets



■ C/C Plates and sheets

- C/C Plates
- C/C Sheets starting from 1mm
- C/C Blocks



■ C/C Friction

- C/C Clutch discs
- C/C Brake rotors



■ C/C Miscellaneous

- C/C PECVD Carrier
- C/C Rollers
- C/C Boats
- C/C Robotic arms
- C/C Glassware, take out tongs, dead-plates, sweep arms.





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The information provided within this document is based upon our present knowledge. As such the information given is to offer an overview on our products and their uses. The information given should not be construed to guarantee the specific properties of the products shown or their suitability for a particular applications.