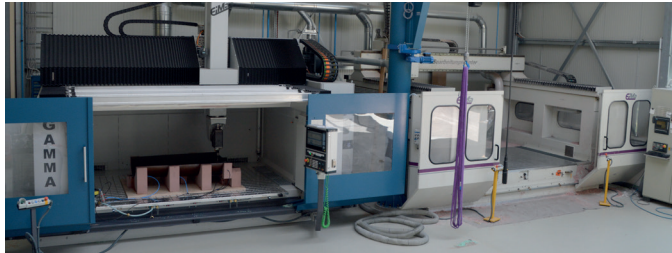


OUR CNC MACHINING CENTRE

We are working with high-end computer aided systems of industrial standard (CAD/CAM). Hahlbrock manufactures geometrically demanding fibre composite parts. Our CAM-software supports full 5-axis-operation of milling and drilling. CAD-data import is possible with standard formats like IGES, STEP, DXF, 3DM (Rhino) and CATPart (Catia V5).



EIMA GAMMA S CNC PORTAL MILLING MACHINE

Length of primary axes x/y/z	3,000/2,000/1,250 mm
Max. traversing speed x/y/z	X-Y: 70 m/min; Z: 40 m/min
Milling spindle	Omlat 15 kW
Spindle speed	24,000 rpm
Tool holder	HSK63-F with switchable interior tool cooling
Max. workpiece/FRP part weight	4,000 kg
Machine control	Sinumerik 840D sl

FOOKE ENDURA 6WT PORTAL MILLING MACHINE

Length of primary axes x/y/z	5,000/2,500/1,300 mm
Max. traversing speed x/y/z	40/40/20 m/min
Spindle speed	25,000 rpm
Tool holder	HSK 40-E
Machine table (tandem arrangement)	4,500 x 1,800 mm
Max. workpiece/FRP part weight	1,500 kg
Machine control	Sinumerik 840D

EIMA FP41 CNC PORTAL MILLING MACHINE

Length of primary axes x/y/z	3,040/2,240/980 mm
Max. traversing speed. x/y/z	40/40/10 m/min
Spindle speed	24,000 rpm
Tool holder	HSK 63-F
Max. workpiece/FRP part weight	4,000 kg
Machine control	Sinumerik 840D

KNOW HOW AND EXPERIENCE FOR YOUR PRODUCTS

The intensive, trust-based collaboration with our customers is one of the most important preconditions for our joint success. This is why we provide comprehensive consultation on the wide range of applications for fibre-reinforced plastics already in advance. In close cooperation with you, we develop tailored individual solutions taking all creative and technical aspects into account.

We present our know how in particular regarding CFRP machining also as a member of CFK-Valley, the network of excellence around the black fibre-reinforced material.



CFK VALLEY™

Our services at a glance:

- Consultation, planning, project management
- Design, material selection
- Process optimisation
- Mock-up, prototyping
- Production of complex parts made of CFRP and GFRP
- CNC milling
- From assembly to operational readiness at the customer's



CONTACT

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High-quality milling of fibre composite parts by a specialist



CFRP machining
Mould construction and model making
Surface reconstruction
Fibre composite parts measurement

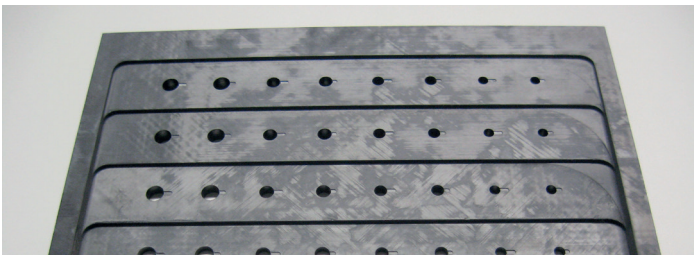
CFRP MACHINING

In the material group of fibre-reinforced plastics (FRP), the carbon fibre reinforced plastics (CFRP) have a special status due to their exceptional properties. This applies to their mechanical properties as well as to the parameters of milling and drilling.

Due to the high level of hardness and brittleness of the fibres in the material composite it has proven to be particularly economical to machine these materials by high speed cutting (HSC) using wear-resistant diamond tools.



Hahlbrock GmbH has many years of experience in the milling and drilling of moulded CFRP parts. With a size of X/Y= 5,000/2,500 mm, our HSC cutting machines can also be used to machine large fibre composite parts in five axes.



Milling machine, control and periphery are designed especially for the dry machining of the electrically conductive fibre composites. The milling programs are created using a CAD/CAM system or alternatively teach-in processes based on a moulded sample part. We have references mainly in the aircraft industry and with suppliers of this market.

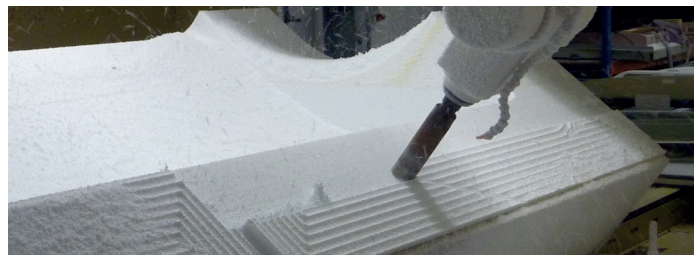
MOULD CONSTRUCTION AND MODEL MAKING

Hahlbrock has powerful mould construction and model making facilities with state-of-the-art CNC milling machine technology which is integrated in a CAD/CAM system.



If you are a user or manufacturer of mouldings made of fibre-reinforced materials and are faced with requirements regarding the geometric complexity and moulding accuracy of your products on a daily basis, we can offer you this capacity to extend your own production and part development:

- Master form and mould making from all model making materials and from aluminium
- Contour milling, drilling, cutting and final machining of fibre composite parts made of GFRP, AFRP and CFRP – in five axes in a CAD/CAM system
- Scanning of complex edge lines in a teach-in process or by surface reconstruction
- Quick serial machining and flexible tool change with shuttle tables



SURFACE RECONSTRUCTION

Reverse engineering, i. e. the reconstruction of existing bodies, surfaces and points of an object in a CAD data model is often the only feasible way to produce optimised moulds or to integrate our customers' existing models into the process chain of fibre-reinforced part production. For these jobs in production and quality assurance, Hahlbrock uses a highly accurate 3D coordinate measuring machine.

The manually guided articulated measuring machine, which is known as "FARO arm" in many areas of state-of-the-art manufacturing, allows for the quick scanning of any surface, edge and point of an object. Due to its portability, the measuring system can be easily used for measuring tasks at the customer's site together with a laptop and the corresponding software.



COMPOSITE PART MEASUREMENT

The measurement of the accuracy of the shape even of very large fibre composite parts is always an important factor in quality assurance. At Hahlbrock, this is done in a CAD/CAM system supported by the CNC machining centre which can be used as a coordinate measuring machine:

The milling spindle, which is equipped with a tactile sensor instead of a milling cutter in this case, scans the surface of the fibre composite part as programmed and automatically creates a point-by-point log of the deviation between the CAD data model of the composite part and the scanned surface point. We offer this procedure for example for serial FRP parts with higher requirements to shape accuracy. In addition, defined connection points at the composite part can be scanned in any position in relation to each other.