

# Carbon System Joints

## Ultralight, Durable and Water-Resistant







www.fior-gentz.com

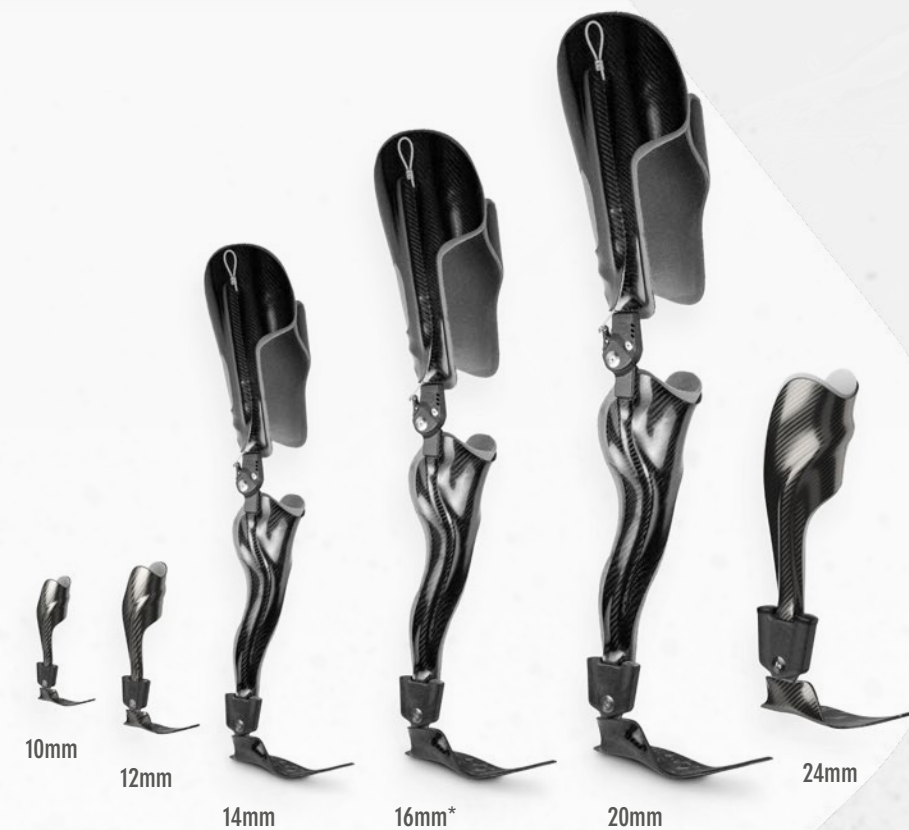
## Carbon System Joints

Our product range contains four different carbon system joints:

- NEURO SWING Carbon system ankle joint
- NEURO CLASSIC Carbon system ankle joint
- NEURO CLASSIC Carbon system knee joint
- NEURO LOCK Carbon system knee joint

The carbon system joints allow patients to enjoy their outdoor activities without restrictions. The ultralight and durable carbon joint case and the seawater-resistant stainless steel screwing defy both wind and rain. An orthosis equipped with these system joints can also be worn on the beach and in the sea and used for many other activities.

With the help of the matching system side bars and system anchors, it is possible to construct an ultralight yet fully functional orthosis that accompanies your patients safely in any weather.



\* The pictured KAFO with a 16mm NEURO LOCK Carbon system knee joint with pulling cable and a 16mm NEURO SWING Carbon system ankle joint has a total weight of only 960g.



NEURO SWING Carbon  
System Ankle Joint



NEURO CLASSIC Carbon  
System Ankle Joint



NEURO CLASSIC Carbon  
System Knee Joint



NEURO LOCK Carbon  
System Knee Joint



# NEURO SWING Carbon System Ankle Joint



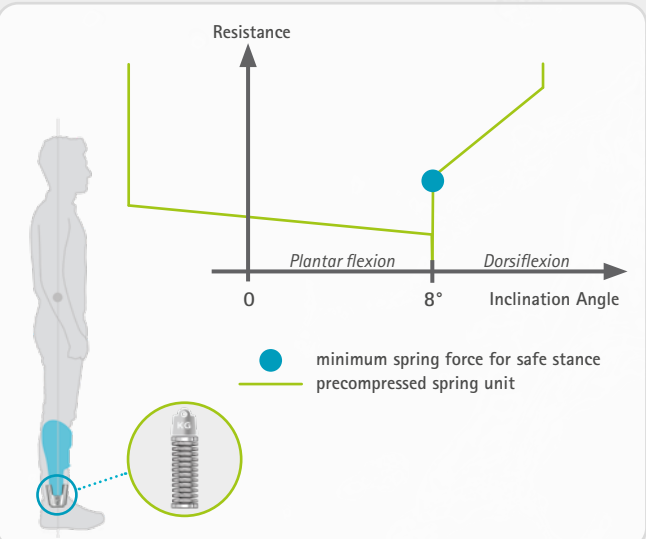
NEURO SWING Carbon

The NEURO SWING Carbon is the ultralight version of the NEURO SWING. With its adjustable alignment and interchangeable spring units, it offers similar advantages as the NEURO SWING, i.e. it dynamically brings the patient into an upright position and stabilises them when walking and standing. Additionally, thanks to the waterproof spring unit sleeves and the water-resistant carbon fibre-reinforced joint case, it can also be used in wet and outdoor areas.

The NEURO CLASSIC Carbon can be used as a supporting joint for the NEURO SWING Carbon.



# Precompressed Spring Units Making a Huge Difference



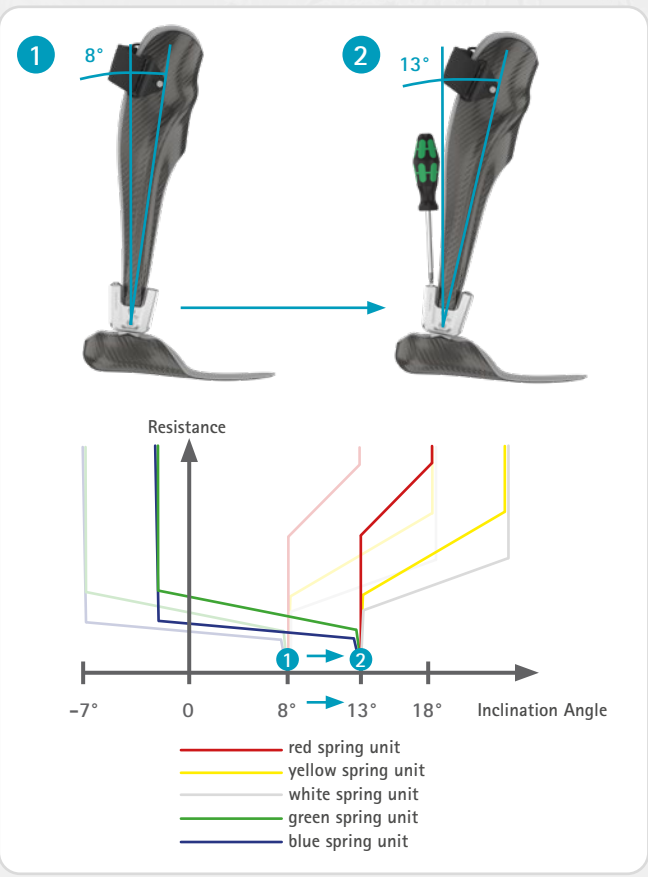
## Safe and Free-Handed Standing and Walking

The main purpose of an orthosis for a calf muscle weakness is to restore safety when standing and walking without depending on additional walking aids. For this purpose, the orthosis must activate the forefoot lever that has been lost due to the weakened calf muscles in order to provide the required resistance to counteract the body weight. Only the precompressed spring units of the system joints of the NEURO SWING product range offer a basic resistance at the required level.

If the basic resistance is overcome during movement, the resistance increases with increasing dorsiflexion due to the additional compression of the spring unit. By individually combining two spring units, different basic resistances can be used in both directions of movement. This way a high basic resistance required in the direction of dorsiflexion can be combined with a low basic resistance in the direction of plantar flexion. The diagram above shows two examples of typical spring characteristics of precompressed spring units with a tibial progression of 8°.



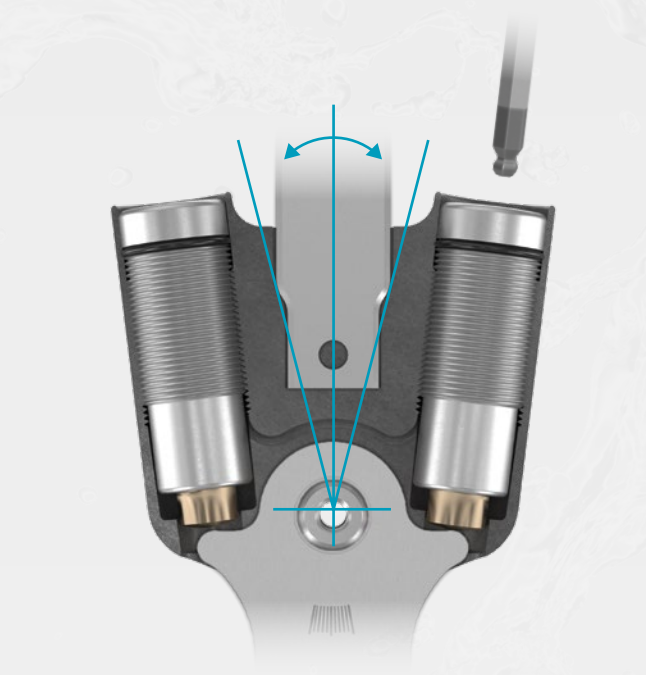
You can find detailed information on the topic of 'Problems of Conventional Fittings' on the FIOR & GENTZ website using the example of non-precompressed spring units and jointless orthoses.



## Independent Adjustment Options

The system joints in the NEURO SWING product range offer five colour-coded, interchangeable spring units with different spring forces. The diagram above shows the basic resistance of the spring units using the coloured spring characteristics. If the lower leg-to-plumb line angle is changed (e.g. 1 -> 2), these spring characteristics shift. The adjustment of the tibial inclination does not change the basic resistance and spring force of the selected spring unit. This clearly shows that the different settings work independently of each other. The original NEURO SWING system ankle joint allowed such independent adjustment for the first time and this unique advantage is still an integral part of the NEURO SWING product range system joints today.

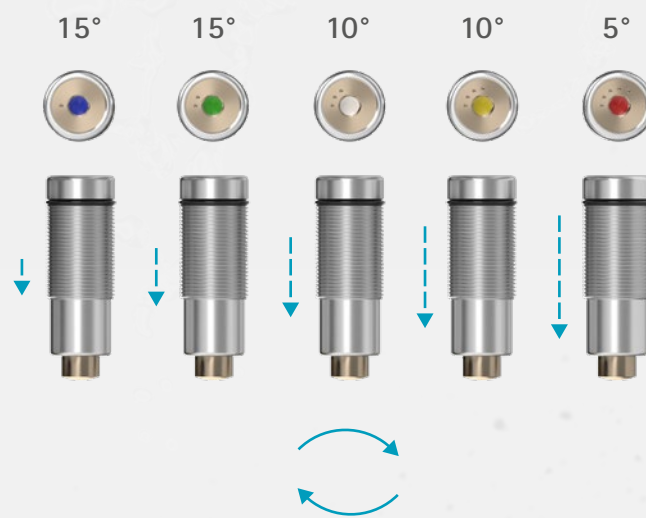
The spring effect of the NEURO SWING system joints can be adjusted to optimise the resistance in both directions of movement of the ankle joint to counteract the body weight as well as the weakness of the calf and foot lifting muscles. The tibial inclination, as starting point for the specific resistances, can easily be adjusted with two alignment screws. This allows a stable position to be defined for a secure stance.



## Adjustable Alignment

Thanks to the adjustment options of the NEURO SWING Carbon system ankle joint, the alignment of the orthosis can be optimally adjusted according to the individual pathological gait. The aim is to achieve a gait that is as physiological as possible. And should the gait change, a quick response by an adjustment modification and tuning is easily possible.

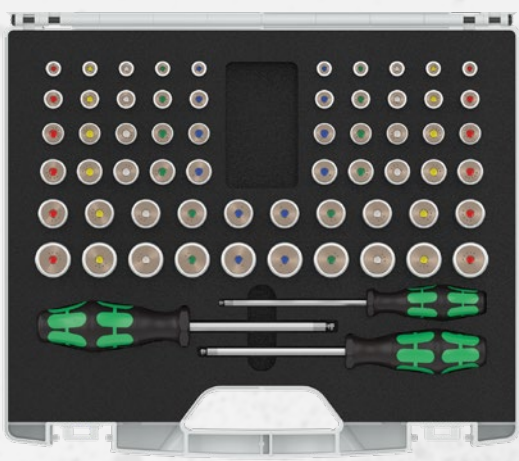
All adjustments can be made separately. They do not influence each other.



## Variable Spring Force

The spring force in plantar flexion and dorsiflexion can be individually adjusted to the patient's needs thanks to interchangeable spring units. The product range comprises a total of five different spring units, with spring forces ranging from normal to extra strong and a range of motion from 15° to 5°.

The spring units of the NEURO SWING Carbon system ankle joint are protected by a water- and dirt-resistant spring unit sleeve.



## Spring Unit Case

A practical spring unit case is available as an accessory for the NEURO SWING Carbon. It contains two spring units per spring force for each system width as well as the necessary tools for exchanging the spring units. Your advantage: with this case, the effects of the different spring forces on the gait can be compared and a flexible reaction to the therapy progress is possible. The case can also be ordered empty for customised equipping.



# Advantages of a Treatment with a NEURO SWING Product Range System Joint

The system joints of the NEURO SWING product range are particularly well suited for patients with a weakness of the dorsiflexors and plantar flexors. Due to their dynamic features, these support patients in standing and walking safely and maintaining their balance without being dependent on other devices.

The additional special features of some of the NEURO SWING product range system joints provide advantages in different environments. For example, some can be used in or around water while others can be adjusted to steep terrain by the patients themselves.

Furthermore, thanks to their adjustment options, the system joints allow a long-term, high-quality and individually adapted treatment as they can be adjusted to changes resulting from the course of the disease at any time.

## NEURO SWING – Overview of System Ankle Joints

|                                                                           | <br>steel/titanium | <br>steel/titanium | <br>carbon | <br>titanium | <br>titanium |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| precompressed spring units                                                | +                                                                                                   | +                                                                                                   | +                                                                                           | +                                                                                             | +                                                                                              |
| All adjustments can be made separately. They do not influence each other. |                                                                                                     |                                                                                                     |                                                                                             |                                                                                               |                                                                                                |
| adjustable alignment                                                      | +                                                                                                   | +                                                                                                   | +                                                                                           | +                                                                                             | +                                                                                              |
| adjustable range of motion                                                | +                                                                                                   | +                                                                                                   | –                                                                                           | +                                                                                             | +                                                                                              |
| variable spring force                                                     | +                                                                                                   | +                                                                                                   | +                                                                                           | +                                                                                             | +                                                                                              |
| integrated shock absorption                                               | –                                                                                                   | +                                                                                                   | –                                                                                           | +                                                                                             | +                                                                                              |
| water-resistant                                                           | –                                                                                                   | –                                                                                                   | +                                                                                           | –                                                                                             | –                                                                                              |
| plug + go modularity                                                      | +                                                                                                   | +                                                                                                   | –                                                                                           | +                                                                                             | –                                                                                              |
| inwards and outwards bent joint versions                                  | +                                                                                                   | +                                                                                                   | –                                                                                           | +                                                                                             | +                                                                                              |
| weight e.g. system width 20mm (titanium + carbon)*                        | 156g                                                                                                | 189g                                                                                                | 104g                                                                                        | 380g                                                                                          | 424g                                                                                           |
| * without spring units                                                    |                                                                                                     |                                                                                                     |                                                                                             |                                                                                               |                                                                                                |



You can find more information on all NEURO SWING product range system ankle joints in the corresponding leaflets in the download section of the FIOR & GENTZ website.

## NEURO CLASSIC Carbon System Ankle Joint



### NEURO CLASSIC Carbon

The NEURO CLASSIC Carbon is a free moving system ankle joint without a dorsiflexion and plantar flexion stop. It is mainly used as a supporting joint for the NEURO SWING Carbon. This enables a bilateral construction with a higher load with only one NEURO SWING Carbon as the main joint and one NEURO CLASSIC Carbon as the supporting joint.



## NEURO CLASSIC Carbon System Knee Joint



### NEURO CLASSIC Carbon

The NEURO CLASSIC Carbon is a free moving system knee joint with integrated posterior offset. It can be mounted unilaterally, but can also be used as a supporting joint for the NEURO LOCK Carbon. This enables a bilateral construction with a higher load with only one NEURO LOCK Carbon as the main joint and one NEURO CLASSIC Carbon as the supporting joint.





# NEURO LOCK Carbon System Knee Joint

extremely durable,  
ultralight  
carbon fibre reinforced  
joint's upper and lower part

dirt- and  
water-resistant

locking pawl with  
fixing pawl

seawater-resistant  
stainless steel screwing



## Locking/Unlocking

The system knee joint is permanently locked via the locking pawl. It can be unlocked for flexing the leg. The unlocking is done via a lever extension (lock lever) or a pulling cable. The orthotist can either mount the lever extension included in the scope of delivery or use a pulling cable which is available as an accessory part.

Special feature: The NEURO LOCK Carbon system knee joint can also be used as a main joint with complete load capacity in a unilateral construction orthosis.



## Permanent Unlocking

The system knee joint can be permanently unlocked via a fixing pawl. This function is recommended, for example, when cycling or doing exercises during physiotherapy.

**NEURO  
LOCK<sub>H2O</sub>**

## NEURO LOCK Carbon

The NEURO LOCK Carbon is a locked system knee joint. It has a locking pawl that can be used to lock it permanently. Thanks to the fixing pawl, the system joint can also be permanently unlocked whereby it becomes a free moving system joint with integrated posterior offset.

The NEURO CLASSIC Carbon can be used as a supporting joint for the NEURO LOCK Carbon.



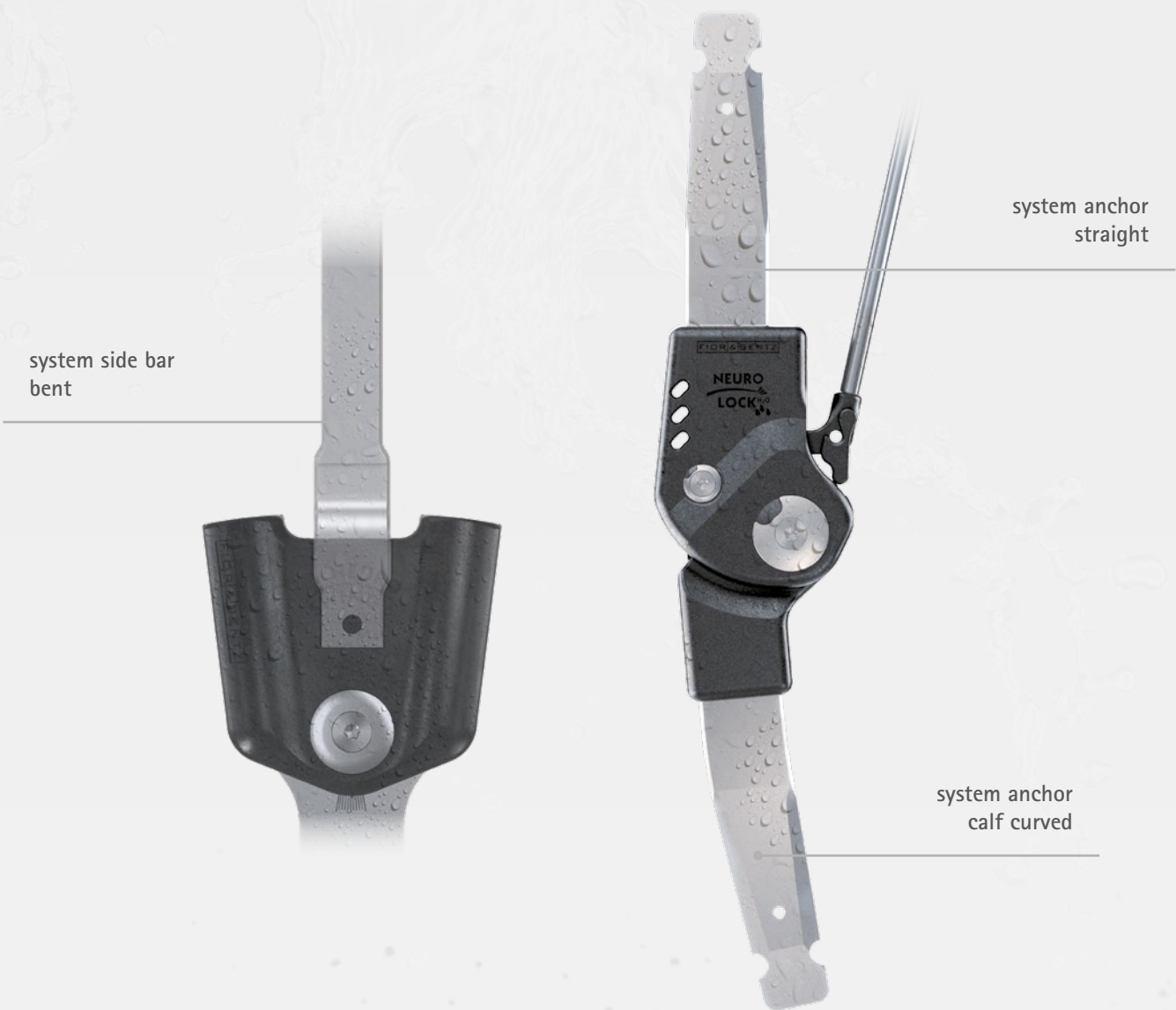
## Precisely Adjustable Extension Stop

If play occurs due to wear, the position of the locking pawl can be infinitely adjusted by means of a precisely adjustable extension stop.



# System Anchors and System Side Bars

For Carbon System Ankle and Knee Joints



## System Anchors and System Side Bars

System anchors and system side bars are connecting elements.

A system anchor for carbon system joints connects the system joint to the shell of a laminated orthosis. The system anchors are laminated into the shell.

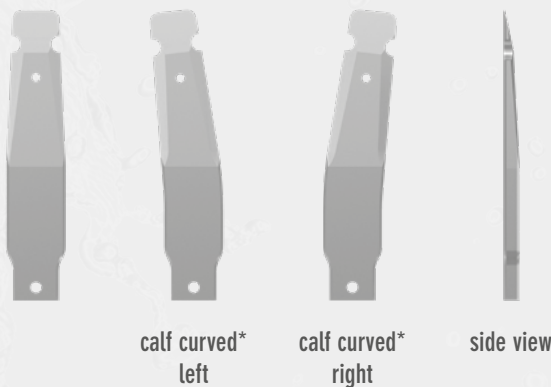
A system side bar connects the system joint to a shell, which can be produced in different ways. The system side bars are connected to the finished shell, for example by adhering/riveting/screwing.

System anchors and system side bars can be connected to both a system ankle joint and a system knee joint.

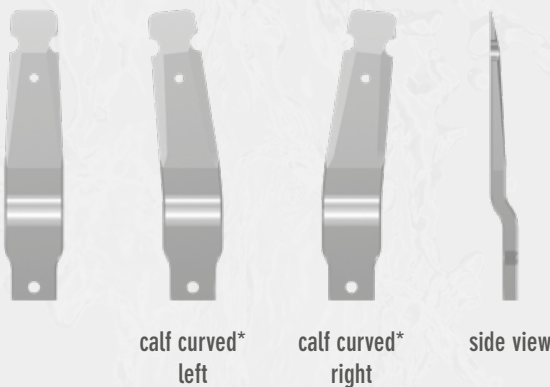
Material: aluminium  
Strength: high  
Breaking Elongation: medium  
Weight: low

You will find detailed information about our production techniques in the section "Online Tutorials" and "Producing the Orthosis" on our website [www.fior-gentz.com](http://www.fior-gentz.com).

## System Anchors – Straight



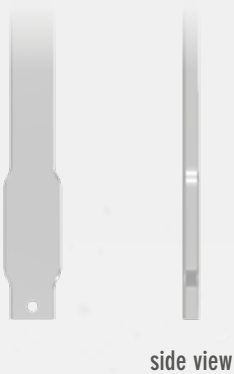
## System Anchors – Bent



\* A system anchor with the shape calf curved follows the anatomical shape of the patient's leg. The calf curve simplifies reinforcing the profiles of a KAFO and thus allows the best possible connection between the system ankle and system knee joint.

All straight and bent system anchors are available in the system widths 12mm, 14mm, 16mm and 20mm and a bent version is also available in 24mm.

## System Side Bars – Straight

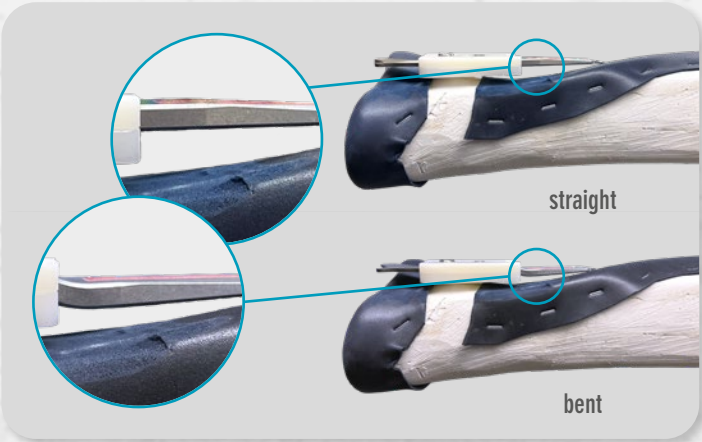


## System Side Bars – Bent



| System Width of the System Joint | 12mm  | 14mm  | 16mm  | 20mm  |
|----------------------------------|-------|-------|-------|-------|
| Length of the System Side Bar    | 265mm | 300mm | 450mm | 530mm |

All straight and bent system side bars are available in the system widths 12mm, 14mm, 16mm and 20mm.



The system anchors and system side bars in the bent shape can be used for larger gaps between the system anchor/system side bar and the leg, as they are industrially prefabricated.



# Example of an Ultralight KAFO with Carbon System Joints



NEURO CLASSIC Carbon  
System Knee Joint

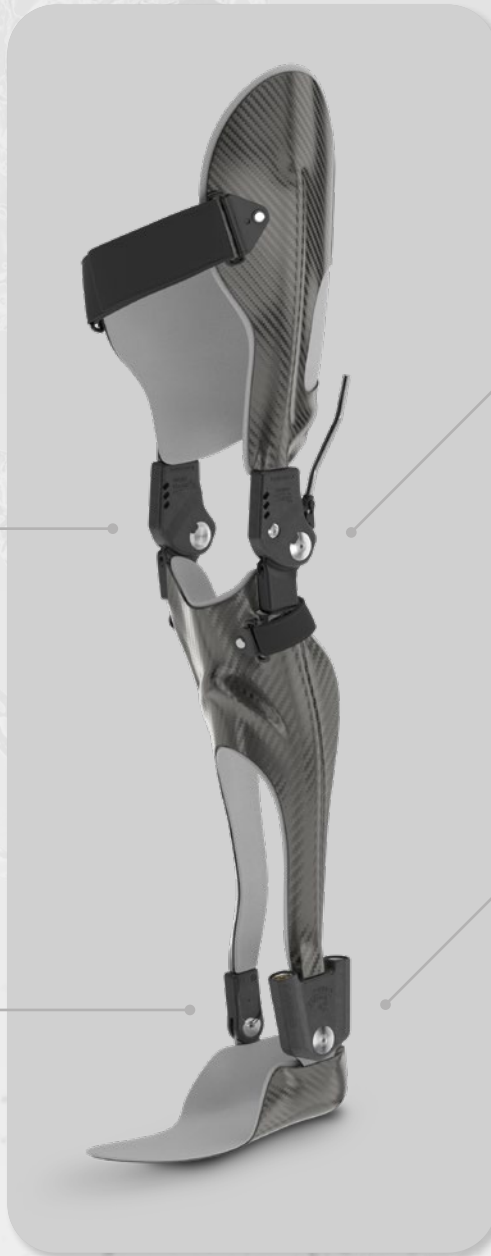


NEURO LOCK Carbon  
System Knee Joint

NEURO CLASSIC Carbon  
System Ankle Joint



NEURO SWING Carbon  
System Ankle Joint



You would like to produce an ultralight, dirt- and water-resistant orthosis made entirely of carbon?

Use the Orthosis Configurator to independently select the components for a carbon orthosis. The Orthosis Configurator determines the appropriate system components using patient data and taking the load capacity into account.



Orthosis  
Configurator

[www.orthosis-configurator.com](http://www.orthosis-configurator.com)

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