ottobock.

Carbon Ankle seven

Dynamics without Compromises

Quality for life

Information for Practitioners

Carbon Ankle seven

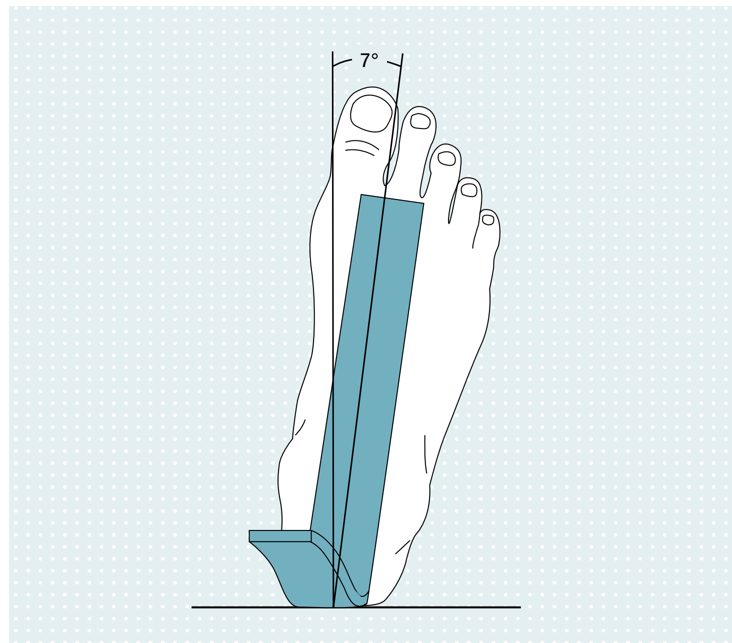
The Carbon Ankle seven belongs to the latest generation of orthotic components. The carbon spring fulfills the highest functional demands and adapts to the individual requirements of the patient. The design makes use of all the benefits of modern material: Carbon is much lighter and considerably more stable than comparable materials despite the extreme thinness of the material. Its energy returning characteristics allow for a particularly dynamic gait pattern.

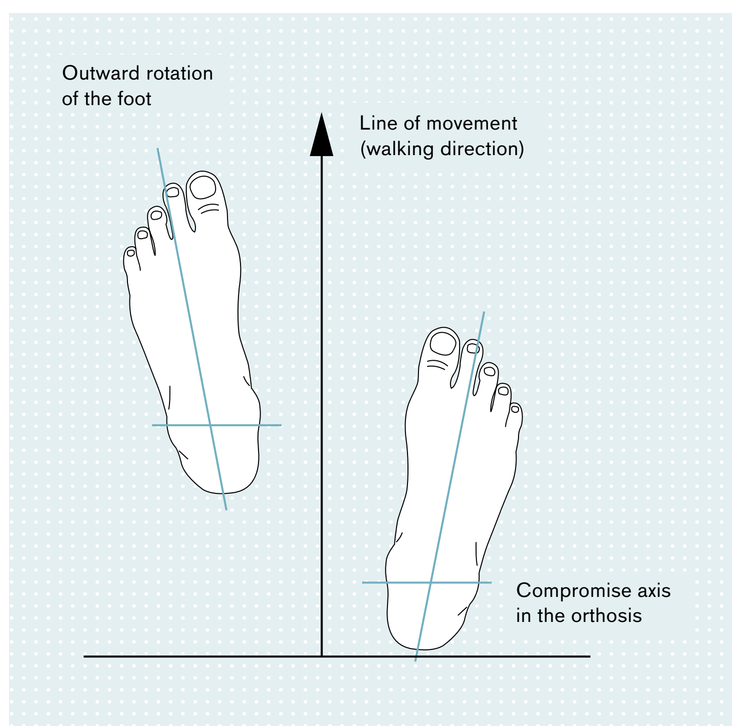
Dynamics without Compromises

The Carbon Ankle seven combines dynamic characteristics with functional requirements and anatomical conditions.

The unique, physiological 7° outward rotation of the carbon spring allows for the precise alignment of the lower extremities. The jointless construction requires no defined dorsal or plantar stops. Thanks to the special design, energy is stored in the carbon spring at heel strike and returned at toe-off. This helps the wearer of the orthosis to walk in a more natural and energy-saving way.

The Carbon Ankle seven is a classified orthotic component, which can be selected to match the individual patient on the basis of activity and weight parameters. The Carbon Ankle seven has been approved for active to very active users of orthoses with a body weight of 10 kg (22 lbs) to 100 kg (220 lbs).





Walking naturally
Application, effects, indications

Application

The Ottobock carbon spring makes it possible to fabricate lightweight lower leg orthoses that are subject to high dynamic loads and promote natural walking with reduced energy expenditure by the orthosis wearer.

Effects

The design of the carbon springs causes the initiation of the hip- and knee-extending moments from loading response to terminal stance and thus achieves extension and knee stability in the lower extremities. The energy generated during heel strike is stored in the carbon matrix and returned at toe-off.

In contrast to conventional ankle foot orthoses, the limitations in the plantar and dorsal direction are dynamic and without static restriction.

Indications

Paralysis or weakness/restriction

- of the foot lifting and foot lowering muscles while using a dynamic ankle foot orthosis,
- of the knee extensors while using a knee ankle foot orthosis (KAFO) with a locked knee joint.
- Diseases such as spina bifida or poliomyelitis are typical basic diseases.

Note:

Fabrication of the orthosis using the thermoplastic technique is described in detail in the Installation Instructions (647G346).

Benefits
at a glance

- Positive influence on the gait pattern
- Very lightweight design
- 7° outward rotation supports physiological alignment of the foot
- Classification allows for individual fitting
- Suitable for thermoplastic and laminated orthoses

To each their own
Classification of the Carbon Ankle seven*

Selecting and Ordering
The Carbon Ankle seven is selected on the basis of the user's body weight and activity level.

- Normal activity:
  A normally active user performs all everyday activities in life independently and engages in rather easy activities.
- High level of activity:
  A highly active user is unrestricted in everyday life. The orthosis of a highly active user must support quick changes from walking to running and vice versa, for example with people doing sports or with children.

In the classification matrix shown below, you will easily find the right article number. Then just select the side (e.g. 17CF1=L9 for the left side with a normally active patient who weighs up to 30 kg/66 lbs).

The delivery includes detailed mounting instructions as well as the attachment material needed for the integration into an orthosis.

Body weight	Activity level		Spring width
	Normal activity	**High activity level**	
100 kg	17CF1=L/R1	17CF1=L/R1	30 mm
90 kg	17CF1=L/R2	17CF1=L/R1	30 mm
80 kg	17CF1=L/R3	17CF1=L/R2	30 mm
70 kg	17CF1=L/R4	17CF1=L/R3	30 mm
60 kg	17CF1=L/R5	17CF1=L/R4	30 mm
50 kg	17CF1=L/R6	17CF1=L/R5	25/30 mm
40 kg	17CF1=L/R8	17CF1=L/R7	25 mm
30 kg	17CF1=L/R9	17CF1=L/R8	25 mm
20 kg	17CF1=L/R11	17CF1=L/R10	22 mm
10 kg	17CF1=L/R12	17CF1=L/R11	22 mm

*** The classification applies to AFOs.
When using the carbon spring for KAFOs, it may be necessary to deviate from the classification.**

Supporting and promoting
Approaching the natural gait pattern

1 Forefoot Support
The supporting and energy returning effect of the carbon spring can be shown with measurements of the ground reaction force within a gait cycle. Figure 1 shows the different courses of the vertical force. Without a dynamic AFO, the patient has no forefoot support and the foot is flaccid (arrow↗). Carbon spring orthoses counterbalance these deficiencies. The spring supports the forefoot until toe-off and thus allows for a close approximation to natural walking.

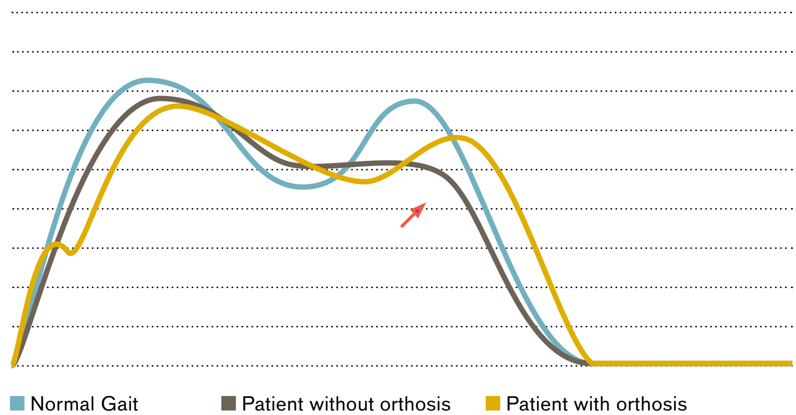


Figure 1

2 Knee Joint Influence
When looking at the knee angle course (Figure 2), the effect of carbon spring orthoses becomes particularly evident. Without a dynamic ankle foot orthosis the patient does not achieve full extension of the knee joint. The slowly increasing knee angle before release of the swing phase (arrow↗) shows that the muscle strength is insufficient. Carbon spring orthoses support knee extension and the course of the angle approaches the physiological course.

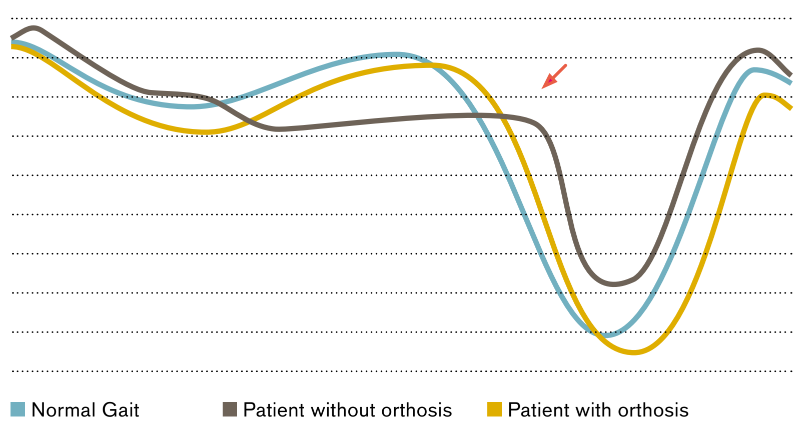


Figure 2

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