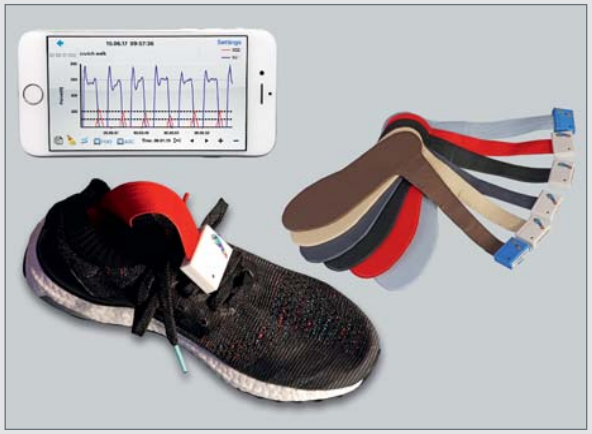
load monitoring device

The loadsol® load monitoring device accurately measures the normal plantar force detected inside the shoe during all static and dynamic activities.

This is the first system to utilize a plantar sensor integrated with compact matchbox size wireless electronics for data processing and transmission. In addition, this is the first system of this size and capability which can accurately measure the plantar force between the foot and the shoe without estimation from other variables such as body weight, acceleration, etc.



loadsol® insole with iPhone and shoe

Technical data of the loadsol® insole:	
sizes	all sizes and custom made
number of sensors	1, 2, or 3 full plantar area
frequency (Hz)	max. 200 Hz
transmission	Bluetooth® LE
operating device	iPhone, iPad, iPod, Android
battery	3V coin cell / 14 hours or rechargeable cell

loadsol®

Evaluation of loadsol® measurement on a Windows PC

Features of the loadsol®

- Measures the plantar force in standing and walking
- Displays bipedal force over time and gives biofeedback
- Provides audio and visual biofeedback on 2 force levels
- Runs with various apps for rehabilitation and biomechanics
- Connects to the novel software family
- Utilizes calibrated, capacitive sensors
- Covers the complete plantar surface of the foot
- Can separate forefoot, midfoot, and hindfoot
- Works with small, lightweight electronics
- Connects to smartphones via Bluetooth®

novel gmbh (Germany) • Ismaninger Str. 51 • 81675 Munich
tel: +49 (89) 417767-0 • fax: +49 (89) 417767-99
e-mail: novel@novel.de • web: www.novel.de

novel electronics inc. (USA) • 964 Grand Avenue • Saint Paul, MN 55105
tel: +1 (651) 221-0505 • fax: +1 (651) 221-0404
e-mail: novelinc@novelusa.com • web: www.novelusa.com

MG Atzori Consultants Ltd (UK) • tel: +44 (115) 9622622
e-mail: noveluk@novel.de

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loadsol®

rehab

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art science®

The loadsol® insole monitors the normal force between the plantar side of the foot and the shoe.

It is now possible for the first time to accurately measure the force statically or dynamically inside a shoe during standing and walking utilizing a large sensor which covers the entire plantar surface of the foot.
The force between the foot and the shoe is accurately measured regardless of which part of the foot is making contact with the ground. This was not previously possible due to the typical characterization of partly loaded flat surface pressure sensors.

The loadsol® is based on a new patent and consists of a large linear sensor that avoids errors. For applications in which the distribution of localized pressure is not of interest, but rather the total load on the foot in up to three areas is of importance, the loadsol® insole is the optimal solution. This new technology has a matchbox sized electronics and communicates wirelessly with a smartphone via Bluetooth®. The data is transmitted to the smartphone in real-time so that the subject can receive an instantaneous biofeedback via sound or vibration. The data can be stored inside the smartphone and later be transferred to a PC for multiple analysis of the data matching with the specific task.
Long-term monitoring of body load on both feet as well as instability, balance, fatigue, performance, and biofeedback are possible.

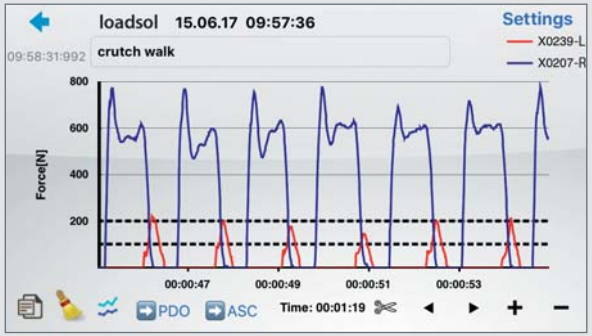
The loadsol® insoles come in any foot size and can be custom made for specific applications.
To eliminate any disturbance or influence to the proprioception of the plantar aspect of the foot, the small electronics are connected to the insole via a very thin

flexible band and then attached to the lacing or shoe upper. This method was chosen over embedding the electronics directly into the insole where electronic parts could disturb the sensation.
Additionally, it is possible to place the loadsol® insole in the shoe at the same time as a subject's corrective insole without disturbing the biomechanical function of the correction insole.

Several smartphone apps will be available, each tailored to the specific application such as long-term load monitoring with biofeedback, bipedal comparison of normal ground reaction force, balance and stability of gait, and monitoring of walking and running.
The loadsol® sensor technology can also be supplied as a dorsal pad that can be put on the upper side of the foot to examine the comfort of the shoe.
The measurement rate of the loadsol® insole can be user-defined. The raw data are available so that users may program their own applications.

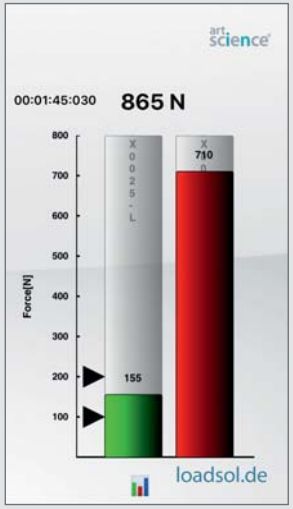
loadsol® with electronics in a therapeutic shoe

Walking with crutches after surgery:



Measurement screen

Settings



Force display left and right with biofeedback range