



The patented loadsol® force sensor accurately measures the normal plantar force detected inside the shoe during all static and dynamic activities using a thin insole which does not disturb the proprioception of the foot.

The flexible sensor technology covers the entire plantar foot in up to three sensor regions.

A miniature electronics transfers the data over Bluetooth to a smartphone.

Additionally, loadsol® 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.

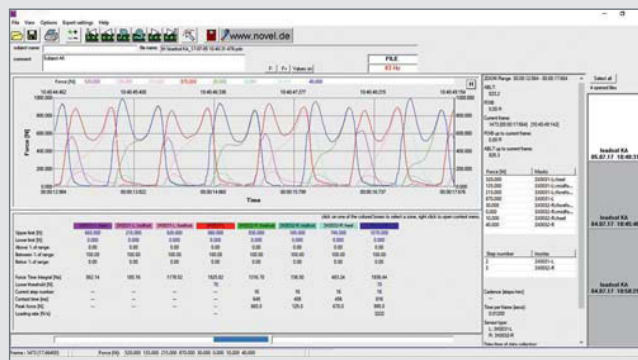


loadsol® insole in the shoe

Technical data of the loadsol® insole

sizes	all sizes and custom made
number of sensors	1, 2, or 3 full plantar area
force range (N)	20 - 2,500* (standard)
frequency (Hz)	max. 200 Hz
transmission	Bluetooth LE
operating device	iPhone, iPad, iPod, Android
battery	3V coin cell / 14 hours or rechargeable cell

*other ranges possible on request



Evaluation of loadsol® measurement on a Windows PC

Features of the loadsol®

- Measures the plantar force in static and dynamic activities
- Scans the foot with up to 200 Hz
- Utilizes patented, capacitive sensors
- Covers the complete plantar surface of the foot
- Can capture forefoot, midfoot, and hindfoot separately
- Works with small, lightweight electronics
- Displays bipedal force over time and gives biofeedback
- Operates with coin cell or rechargeable batteries
- Displays the data in real time on mobile devices
- Can be automatically stored to the cloud
- Runs with various apps for biomechanics
- Connects to the novel software
- Allows ASCII output and comprehensive Windows data analysis
- Works with iOS and Android

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All systems from novel operate with high quality, calibrated sensors and provide reliable and reproducible long term measurements. loadsol®, loadpad®, pedar®, artscience®, and the novel logo (colored foot) are the registered trademarks of novel gmbh © 1992-2018



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

With the loadsol® system from novel it is possible to measure the normal ground reaction force on the plantar surface of the foot in both standing and dynamic movements. Utilizing one flexible, flat sensor which covers the entire plantar surface of the foot, loadsol® measures the force between the foot and the shoe, regardless of which part of the foot is in contact with the insole. The loadsol® sensor is based on new patented technology and due to its linear properties it also measures partial loads accurately. Unlike the pedar® system which accurately measures the high resolution local distribution of force, the loadsol® will measure the total force on the foot or on a few subareas of the foot.



loadsol® measurement in ski boots

This technology has matchbox-sized electronics and communicates wirelessly via Bluetooth with a smartphone. The force values are displayed on the smartphone in real time. The user can also receive immediate biofeedback regarding the load on the foot via an auditory, visual, or

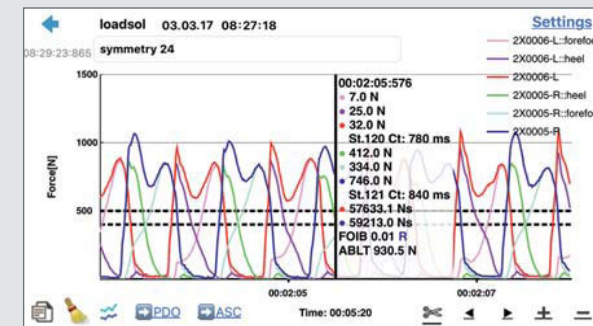


vibratory signal. The measured data can be stored on the smartphone and to the cloud and additionally transferred to a computer for a more detailed analysis. Long-term measurements allow the evaluation of various parameters such as gait instability, impulse, cadence, balance, fatigue, and performance.

The loadsol® insole conforms well to surfaces and therefore it is possible to wear an orthotic in addition to the loadsol® measuring insoles. The electronics were intentionally not integrated into the thin loadsol® sensor. This does not affect the proprioception of the plantar surface of the foot, the biomechanics of the gait, as well as the function of a corrective orthotic. The miniature electronics can be attached to the upper part of the shoe, i.e. the laces.

The loadsol® app is tailored to specific applications such as long-term biofeedback load monitoring, bipedal comparison of balance and gait, as well as the evaluation of cadence or loading rate during running. In order to be able to further evaluate the acquired data for other applications, the data can be exported to an ASCII file. Additionally, the Windows loadpad® analysis software offers an extensive evaluation of the loadsol® data on the computer.

The loadsol® is available in all shoe sizes and in four versions with different sensor area layouts. The load on the foot can also be captured separately in up to three subareas. For specific applications there are additional individual divisions and sizes available.



Walking symmetry

Subject name: **BW: 80 kg** More... Apply Cancel

loadsol KA Interval length [s]: 10

max Force[N]: 2500 Measurement time [s]: 10000

Force range [N]: show lines Visual feedback:

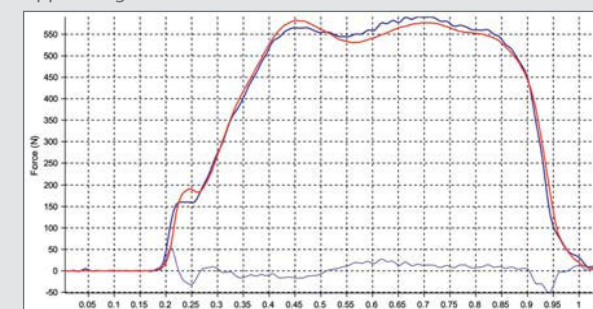
upper limit: 500 Protected:

lower limit: 400 Autostoring:

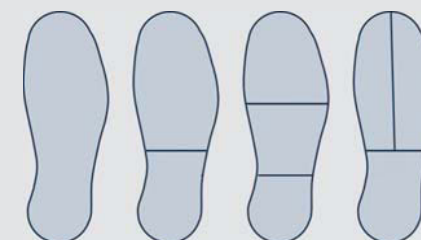
Biofeedback: with Comment:

sound vibrate with ASCII:

App setting



Force platform (red) versus loadsol® (blue) at 100 Hz



Division of the sensor surface in four layouts