

KISTLER

measure. analyze. innovate.

How to prevent injuries in competitive sports



SCL Tigers in great shape through targeted training

Force plates from Kistler improve the performance diagnostics of a Swiss ice hockey team





Intensity and dynamics in ice hockey bring along a certain risk of injury.

SCL Tigers are currently one of Switzerland's strongest ice hockey teams – but targeted strength and endurance training is not the only factor in their success. After a strenuous match, it's very important for the players to have the time they need to regenerate sufficiently before they next take to the rink. And Kistler's Quattro Jump performance analysis system provides them with effective support to do just that.

Like bullets fired from a gun, the players race over the ice at breathtaking speed as they chase the puck. Sudden changes of direction, daredevil maneuvers and spectacular checks add to the thrills as athletes weighing 100 kilos or more collide with one another or crash into the boards. Physical confrontations are also part of the game. Ice hockey is probably the world's fastest team sport – and the one that demands most energy. Players are virtually bound to sustain injuries, even though they wear heavy-duty protective gear and substitutions are carefully phased.

If statistics are to be believed, 80% of injuries sustained by players during matches are acute traumas such as bruises, and 20% of such injuries are due to overload. Because this sport drains the players of so much energy, it is important for them to

regenerate sufficiently before their next match – even if they have not been injured. Since it is known that specific muscle fatigue significantly increases the risk of injuries, the athlete may need to shift down a gear and give the muscles time to fully regenerate.

Tigers on top form

SCL Tigers of Langnau only returned to the top tier of the Swiss national hockey league in 2015, and they have continued to perform amazingly well throughout the current season. Nik Hess, SCL Tigers' athletics trainer, is responsible for making sure that this trend continues. As team coach since summer 2013, his responsibilities include rehabilitation training for injured players. Hess also works for the Swiss Ice Hockey Federation (SIHF), the supraregional association that promotes ice hockey in Switzerland. At the SIHF, he is in charge of performance analysis for the national team – and it was through this work that he became familiar with Kistler's products. Hess is currently working on a reference value that can be used to measure the performance potential of ice hockey players. The power-to-weight ratio provides meaningful information about this – some SCL Tigers players manage to achieve as much as 75W/kg.

"Thanks to the force plates, we can prevent injuries because we can detect muscle fatigue at an early stage, and then we can adapt the athlete's training as appropriate."

Nik Hess, athletics trainer of SCL Tigers as well as Swiss national team coach

Regeneration for fatigued muscles

Hess views Kistler's Quattro Jump force plate system as the ideal instrument to deliver precise insights into his athletes' fundamental performance parameters. Efficient and closely monitored performance tests help him to arrive at an objective assessment of individual performance capability – a valuable basis for improving coordination of the training and regeneration phases for his athletes so they are better able to achieve their individual development goals. "Ice hockey is very much a body-focused sport that demands speed and power, so varied training is an absolute must," Hess points out. As well as speed, this sport places demands on the players' stamina, power, coordination and flexibility, and it calls for a whole series of motor skills.

For his performance tests, Hess makes particular use of the countermovement jump and the squat jump. These two types of jump are performed on the force plate. A jump essentially comprises coordinated extension of the trunk, hips, knees and ankle joints. Countermovement and squat jumps are among the most frequently used tests to measure maximum anaerobic power output from the lower extremities. "Thanks to the force plates, we can prevent injuries because we can detect muscle fatigue at an early stage, and then we can adapt the athlete's training as appropriate."

Test results from a countermovement jump make it possible to detect fatigue of this sort. It is a vertical jump with eccentric-concentric muscle activity, which means that the athlete makes a powerful downward countermovement before jumping. As well as the various phases of the jump and the related timing, the explosive power is measured. Hess usually has his players perform the countermovement jump after a match, and knowledge gained from the test is then inputted into the athletes' individual training programs. "We carry out subjective tests with the players to discover how well prepared they are for their next appearance on the ice. Thanks to the force plates, we can also incorporate the objective component. What's interesting is that the two types of assessment don't always coincide. A player could feel that he's prepared – but his muscles might not be ready."



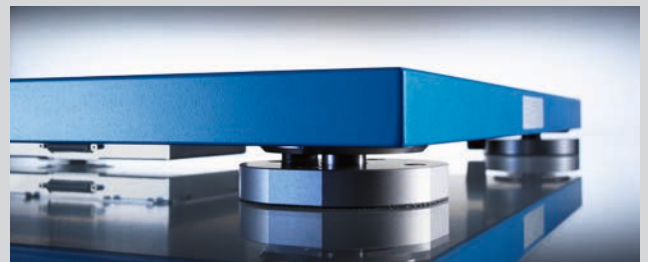
Keep going! Also in summer, ice hockey players have to keep a high training intensity.



Using the Kistler force plate system, Nik Hess gains deep insight into the performance status of each player.

Performance analysis with Kistler force plate systems

Kistler force plates combined with our MARS software offer a highly effective solution for capturing rapid movements and minimal changes in athletes' performance.



Versatile tool for performance diagnostics and clinical analyse: force plate from Kistler.

Main features

- Great variety of force plates for different applications: portable, fixed, transparent and either measuring a single force or all three orthogonal ones
- Easy-to-use MARS software with modular functionalities
- Precise and reliable measurement through piezoelectric technology
- One-click performance report

Your benefits

- Frequent and quick estimation of athletes' performance including graphical evaluation
- Enhancement of performance and prevention of injuries
- Easy comparison of athletes and their individual fitness development
- Continuous system development and responsive service by Kistler

KISTLER
measure. analyze. innovate.

Take the lead – right from the start

Biomechanics
Force measurement solutions for motion analysis, sport performance diagnostics, rehabilitation and ergonomics

Safe braking thanks to efficient maintenance

Brake force measurement in the rail transport sector
Sensors and accessories for periodic brake force testing

Flexible to create and easy to integrate

Weigh In Motion
Measuring equipment for a wide range of traffic data collection, enforcement and toll collection applications

Measuring equipment for demanding T&M applications

Test & Measurement
Sensors and signal conditioning systems

Develop and operate gas turbines more efficiently

Gas turbine monitoring
Monitoring combustion dynamics improves turbomachinery performance

Analyzing and commanding sophisticated machining processes

Cutting force measurement
Force measuring systems for machining

Find out more about our applications:
www.kistler.com/applications

Kistler Group
Eulachstrasse 22
8408 Winterthur
Switzerland
Tel. +41 52 224 11 11

Kistler Group products are protected by various intellectual property rights. For more details, visit www.kistler.com. The Kistler Group includes Kistler Holding AG and all its subsidiaries in Europe, Asia, the Americas and Australia.

Find your local contact at
www.kistler.com

KISTLER
measure. analyze. innovate.