



Compression Garments Fact Sheet

Sports scientists are constantly discovering new ways to take human athletic performance to the next level. Compression garments represent a way of safely and legally manipulating human physiology to produce an internal environment that is more conducive to high performance and faster recovery. The science behind compression garments is not new and compression garments have been used clinically for many years to treat venous insufficiency, edema and prevent deep vein thrombosis in post operative patients. However it has not been until more recently that the positive effects in athletic populations have been discovered. Exciting new research is emerging from numerous sports science laboratories around the world as to the multitude of beneficial effects that compression garments can provide the athlete.

INCREASED VO₂MAX AND ANAEROBIC THRESHOLD

Recent research in trained athletes reported that compression garments increased VO₂max by 10% and anaerobic threshold by 40%. Given that these two physiological variables are highly correlated to success in endurance sports compression garments may provide a significant competitive advantage for endurance athletes.

REDUCED MUSCLE OSCILLATION

It has been suggested that excess oscillatory displacement of a muscle during a dynamic movement may contribute to fatigue and interfere with neurotransmission and optimal muscle recruitment patterns. Recent research reported that compression garments were able to significantly reduce longitudinal and anterior-posterior muscle oscillation by 0.32 and 0.40cm respectively upon landing from a maximal vertical jump.

ENHANCED PROPRIOCEPTION

Proprioception or joint position sense has major implications to athletic performance, particularly in the areas of technique and injury prevention. Research investigating hip joint proprioception reported significantly greater joint position sense at both 45 and 60 degrees hip flexion.

INCREASED EXPLOSIVE MUSCULAR POWER

Explosive muscular power is highly correlated with success in most sports. Research in track and field athletes has reported a 5.2% increase in maximal vertical jump height when vertical jumps are measured wearing compression garments.

MOISTURE EFFECT

Another feature of compression garments is the composition of the fabric used that promotes evaporative cooling and prevents moisture accumulating underneath the garment. Tests show that this feature can reduce surface temperature by 3 Celsius. This effect not only leaves skin dry in the heat but enhances evaporative cooling, with a greater effect the more the wearer perspires. Thus, the garment is cooling, particularly during exercise. They also accelerate warm up of cold muscles.

REDUCED BLOOD LACTATE CONCENTRATIONS

High intensity exercise produces lactic acid which presents a challenge to the body's ability to maintain pH within the narrow physiological range. This in turn can negatively impact the force generating capacity of the muscle which results in muscle fatigue and impaired athletic performance. Data published by Berry and McMurray showed a 14% decrease in blood lactate concentrations 15 minutes following high intensity exercise when compression garments were worn during and after exercise.

FASTER RECOVERY

Muscle damage is an inevitable consequence of high intensity exercise and any technique that can facilitate muscle repair and faster recovery is of large benefit to the athlete. A study in elite Rugby Union players reported that compression garments worn immediately after a rugby match significantly reduced markers of muscle damage (creatinine kinase) compared to passive recovery at 36 and 84 hours post match.



Things to consider...

Graded compression Garments

While they may look very similar to the lycra tights that were popular in the 80's there is far more physiology behind compression garments than meets the eye.

Graded compression means that the compression exerted by the garments differs over a given distance. If long lower body garments are used as an example, compression at the ankle and calf is higher than at the thigh. This facilitates the flow of blood through the deep veins back towards the heart. This increase in blood flow and venous return to the heart is one of the reasons why compression garments are used in clinical applications such as prevention of deep vein thrombosis post surgery. Although graded compression garments have been used clinically for many years, it is only more recently that the potential beneficial physiological effects of graded compression has been acknowledged in the athletic environment.

Some companies quote the pressure exerted by their garments, is this accurate?

The truth is that there is no globally accepted methodology to measure the compression that commercially available compression garments provide. This is why many manufacturers will quote compression data without indicating the methodology they used to measure it. Compression data means nothing if the method used cannot be proven to be reliable and valid. Furthermore the compression exerted will depend on the individual wearing the garment. Anthropometric measurements differ greatly between individuals and even two individuals with the same height and weight can vary greatly in limb girths. So when companies give a single reading for the compression provided at the ankle, calf and thigh, these readings likely only apply to a single person and if anyone else tried on the same compression garment the pressures would not be identical.

Gradient Compression Garments follow a simple but very effective mechanism: the muscles

- Ergonomically patterned to the anatomy
- Enhanced circulation
- Aid lactic acid removal
- Increase flow of oxygen
- Reduce muscle vibration
- Reduce delayed muscle soreness (DOMS)
- Reduce muscle and ligament strain by keeping muscles in line and at optimum position
- Aid recovery after exercise
- Keep muscles warm without overheating