

How Back on Track works

Back on Track's joint and muscle support are all made of functional textiles with heat reflective properties. The textile is a synergy of ancient Chinese experience and modern scientific textile technology. During the manufacturing of polyester- or polyester fibres, the ceramic particles are fused into the fibres. When heated, the ceramic particles radiate a heat back towards the body. This reflected heat is long-wave heat radiation, which is also known as long wave infrared radiation.

Heat Radiation

It is well established and documented that long wave infrared heat radiation increases the blood circulation. The increased blood circulation in the tissues helps to relieve muscles tension and improves performance. One important property is the injury prevention effect, which you get when the protections are used for training and competition.

Deepening in the function

Heat energy can be transported in three ways: conduction (transfer), convection or radiation.

1. When heat transfer or conduction occurs, the heat in a material spreads from one part of the material to another.
2. Convection is the loss of heat when a heated liquid or gas (e.g. air) is displaced, carrying the heat with it. The insulating material in ordinary clothing and joint supports, for example cotton, wool and neoprene, is designed to prevent convection and thus retains body heat in the air outside the skin.
3. Radiation occurs when a heat source emits heat radiation, where upon it collides with another surface and heats it. Back on Track's products work with radiant heat, the purpose of which is to avoid trapping the heat through insulation. This is so that the protection has a respiratory function, while heat energy in the body tissues increases.

People and animals radiate body heat, both at rest and in activity, however less heat is radiated when at rest. When a material is hit with heat rays, three things can occur.

1. The rays can pass straight through the material, which is called transmittance. An example of this is when the sun's heat rays hit a glass plate. The majority of the heat radiation passes through the glass. You would feel this effect if you were to stand in a room with the sun shining through the window.
2. The second thing that can happen is that the rays bounce on the material's surface and are reflected away, called reflectance. If all the heat is reflected the material will not be heated as none of the rays radiate through the material.
3. The third that can happen is the material absorbs the heat rays, which is called absorbance. Radiated heat can have different wavelengths depending on the temperature of the heat source and the material. Radiant heat is usually within the range of what is called infrared radiation, which means wavelengths between 0.7 microns and 1 mm. A material absorbs different amounts of heat radiation depending on the wavelength of the

radiation. This is called the material's absorption spectrum. The radiant heat absorbed increases the heat content of the material.

A material has not only an absorption spectrum but also an emission spectrum. An emission spectrum essentially means that different materials radiate heat of various wavelengths within different temperatures. The amount of radiation and the radiation wavelength varies depending on the heat source temperature and the emission spectrum of the heat source materials. Generally, one can say that the lower the temperature heat source is the longer the wavelength of the heat radiation.

When manufacturing the polyester and polypropylene fibres that Back on Track products are made of, ceramic particles are fused into the textile fibres. The selection of these ceramic particles is based on which absorption and emission spectrum they contain. The result is that when the ceramic particles absorb the body's heat radiation, they expel heat of a specific wavelength, which is based in the long-wave infrared zone of the thermal radiation spectrum. It is well established and documented that long wave infrared heat radiation has a pain reducing effect and increases blood circulation.

Just like other materials, the body's tissues has its own absorption spectrum. The wavelength that the ceramic particles issue is absorbed in the cells. A signal is sent to the brain telling it that heat energy has increased, to which the brain opens up the veins. The absorption happens not only in the skin but also deeper down the tissue, which makes the veins wider not only superficially but also in the muscles and around the joints. The increased blood circulation in the tissues relieves muscle tension and strengthens the body's own ability to reduce inflammations and heal injuries. The products are therefore often used in cases where inflammation is part of the problem. Another important application is injury prevention, which you get when the protections are used for training and competition.