



BY SERNIS

BIOCERAMICS IN TEXTILE

Application protocol

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CONTENTS

- Bioceramics** 3
 - What is it?
 - How it works? The science behind the material
- Innovations ntextile** 6
 - Why ntextile?
- Applications**..... 7
 - Context
 - Health
 - Sports
 - Well being
- Conclusion** 12
- Bibliography**..... 12

“In Nature nothing is created, nothing is lost, everything changes.”

Lavoisier – Founder of Modern Chemistry

Bioceramics

What is it?



It's an inorganic, non-metallic, polycrystalline refractory mineral.

This material has been previously used as basis to prosthetics and implants, as its composition doesn't have any reaction in organic tissues, resulting in the infection risk being reduced to a minimum.

However, in the last decades it is being searched for its ability to emit a radiation in the Infrared spectrum, the Far Infrared, or FIR. This radiation, when transmitted by the bioceramics is named cFIR, and has specific characteristics due to its wavelength. Previously to the exploitation of bioceramics, cFIR was emitted in saunas, recurring to specific light bulbs for this task. These light bulbs are still nowadays easy to acquire in electronic stores for various purposes, including domestics.

Bioceramics does not require an external energy source because it generates its radiation using the energy released as heat by the organism of its users, making this technology not only sustainable and ecological, but also innocuous and economical. In a simplified way, this technology works as an energy mirror.

Bioceramics is produced by combining oxides such as magnesium, silica, aluminum, tourmaline, and mica, among others. The association of these minerals to obtain bioceramics may vary depending on the exact wished goal. It's also used in discs format. This material is now being processed to have the consistency of powder so it can be assimilated in different products - such as textile fibers and string - for its integration in fabric with different compositions, so that it can be applied in different formats, uniting the textile and medical industries to benefit the user.

How it works? The science behind the material



Every radiation affects matter, as well as energy. We are, like everything that exists, equal parts matter and energy. Every day we are exposed to radiations - the ones we see and the ones that are invisible to our eyes. Some of these radiations have harmful effects. As an example, there's the X-Ray, a fundamental technology since the times of modern medicine. Despite its utility in the diagnosis process, this radiation has a destructive effect on a cellular and molecular level, to a point where, before the developing of adequate protection gear, the exposition of X-Ray would cause severe genetic mutation in radiology technicians.

With FIR radiation, the affectation of matter and energy happens in a different way. Between other effects, this radiation acts on molecular bonds and on small constituents of the cells – mitochondria.

An important notion to comprehend the science and mechanics behind this material is water clusters. One water molecule is constituted by one atom of hydrogen and two atoms of oxygen. In the case of water clusters, several molecules group and create bonds, forming a water macromolecule. Despite the fact that these structures are still water, this one gets denser, as it is composed by particles of a much larger dimension. At this point, the formation of these structures is one of the unsolved problems of chemistry.

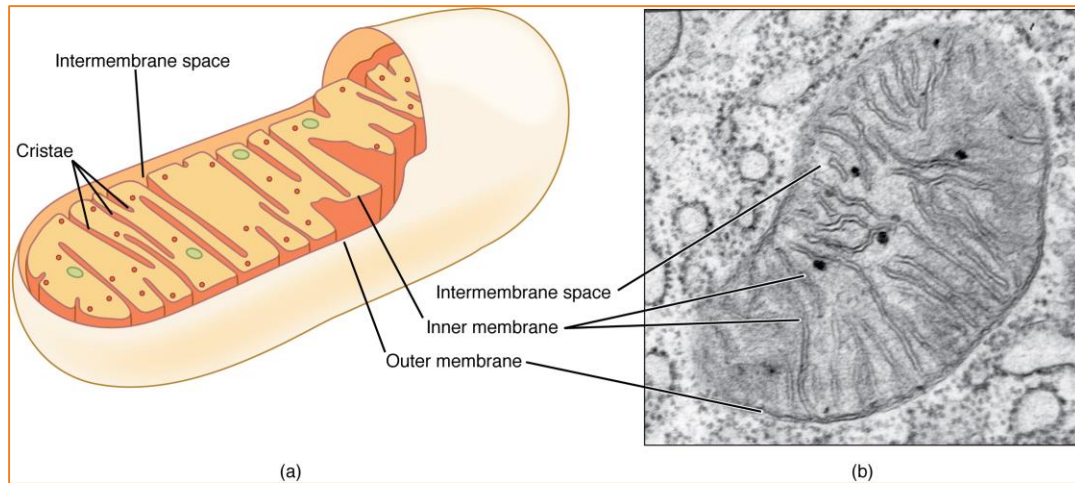
The role that is here played by the FIR radiation is simple. The vibration transmitted to the water (whether it is in the human body or not) weakens the bonds between these molecules, until they break. As a consequence, this makes this energized water less dense and more fluid, as its original structure of smaller molecules is restored.

Inside the cell, one of the components most affected by this radiation is also one of the most important for the running of the entire organism. The mitochondrion is the cell organelle responsible for the conversion of the ingested energy in cellular energy – ATP. Besides the energy production, the mitochondria are also responsible for regulating the cell metabolism. FIR ray cause a slight increase on the ATP production, increasing the oxygen consumption.

On a cellular level, there is also the action that FIR has on the cell membrane – the layer that covers up the cell and acts like its skin. This membrane has in its constitution a hydrophobic layer, which means it repels water. The FIR radiation shakes the constituents of this layer, turning the cell more permeable, making it easier for the water and required nutrients no enter the cell, leading to a good running of the organism.

The FIR radiation emitted through bioceramics presents a singular characteristic that adds up comfort to all the advantages inherent from its use. Unlike lamps or clothing with physiotherapeutic ends, this radiation does not radiate heat detectable by the skin's thermo receptors, regardless of its intensity or efficiency.

a) Schematic view of a mitochondria. b) Microscope view of a mitochondria.



Innovations ntextile



The bioceramics product developed by SERNIS is composed mainly by the mineral Tourmaline combined with other elements to optimize its action without adding any harmful effect. Tourmaline is a mineral which composition is mainly silica, boron and aluminum. This mineral has been used, in the past of thousands of years, for its benefic action in the organism in diverse techniques in modern and ancient medicine, as well as in pagan rituals. However, the associations of the different components in ntextile results in a product that sets itself apart by its safety and its efficiency.


The elements combination made in our labs is the perfect equation for a FIR radiation in a delicate balance of effectiveness and safety.

The ntextile product presents itself in a solution for textile stamping, to give the fabrics the intended properties.

Tourmaline as found in nature




Why ntextile?

-  Developing this product has the goal to have the most sophisticated innovation serving health and people. We want the best scientific research to be used for your well-being.

Your quality of life is our priority, and that is the reason why we are gathering our efforts and committing to bring this technology to your house at the best price, in a comfortable way. Maintaining our excellency commitment with you.

Applications

Context

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Health

Bioceramics and pain

When mentioning chronicle pain, we are talking about long-term pain with a big sensibility to thermic and mechanic stimuli, as well as a hyper sensibility to harmless stimuli. To treat this kind of pain, there is two treatment groups in the field of physical therapy: electrotherapy and phototherapy. The use of bioceramics as a FIR ray emitter fits in the phototherapy field.

One of the reasons why bioceramics is so effective on health - where other techniques fail - is due to the fact that that its heat emission can penetrate the skin four centimeters deep without being in any way invasive to the body, as well as its lack of any discomfort for the user, allowing it to reach muscle and bone layers, as well as the circulatory system.

The use of bioceramics clothing is effective acting on inflammations, both in mitigating symptoms by improving discomfort, as well as acting to reduce the inflammation, acting on the origin on the problem.

Strengthening the Organism

It has been shown that the incidence of this radiation in the scalp zone results in a notorious increase of hair density. Long term, this result will be crescent, which means this technology has a role to play as much as in hair

loss as in its prevention.

For the fortification of an organism weakened – either it is by recovery from an accident, chemotherapy, or any other event with impact on the body – bioceramics plays a proactive role by its ability to regenerate capillary blood vessels, in other words, angiogenesis.

By the action of band aids impregnated with this mineral, by the FIR action, it is possible to obtain a significant improvement in dermic regeneration in various situations.

In patients that were victims of the formation of a thrombus, or thrombosis, and, for that reason, have a lack of blood supply to a determined body part or organ (because of the obstruction caused by the thrombus) – ischemia, this radiation helps to reconstitute the blocked circulation.

The use of socks with ntextile properties brings a reduction in chronic foot pains caused by diabetic neuropathy, as well as swellings brought by long hours standing or just due to circulatory problems.



Fighting Cancer

In skin cancer – melanoma cases - this radiation has proved efficient fighting cancer cells with low HSP70 levels. HSP70 is a substance fairly aggressive to the organism that develops gradually in skin cancer cells. The longer it takes since the beginning of the melanoma development, the more this substance concentrates - and in a larger amount of cells. For this reason, FIR radiation shows a good success rate in the combat of early caught cancer.

In the case of breast cancer, when a patient is submitted to FIR there is an increase of cell surviving. This radiation also offers protection against the radiation emitted by chemo and radiotherapy treatments, promoting reproductive cell in post-exposure periods and by rinsing at a cellular level, in order to purify the organism from hydrogen peroxide, as this substance is used to fight cancer cells, but in the used amounts is also highly prejudicial to the organism.



The female body

When it comes to motherhood, ntextile also offers some help. Bioceramics discs applied on the breasts of new mothers with problems with the lactation process help to a higher breast milk production so that it can suffice for the feeding of newborn babies.

Still thinking of the female body and its uniqueness, ntextile helps soothe the adversities caused by menstruation, from abdominal discomfort to the most acute colic, by the use of belts or abdominal girds in a comfortable fabric that can adapt to the anatomy of each and every woman.

Gloves containing ntextile can be used as an effective treatment for hand

arthritis and Raynaud Disease. Characterized by a lack of oxygenation in the fingers, until these obtain a blue color when exposed to low temperatures, these symptoms are episodic, which means that upon restoration of the body temperature, the oxygenation gets back to normal, resulting in a disappearance of all symptoms.

Textile industry production room



Sports



Sports and your body

To best understand the advantages of the sports practice associated with the use of ntextile clothing, it is required to comprehend two parts of the Nervous System that are responsible for the organism regulation.

The Sympathetic Nervous System regulates a part of the Human Body functions. It stimulates the organism to respond in stress situations. These reactions translate in a speeding of heart beat, release of adrenaline into the blood flow and an increasing in the metabolism. All of these reactions happen in an involuntary manner. Besides situations of danger, pressure, or situations of violent arguments, the Nervous Sympathetic System is activated during sports practice.

The Parasympathetic Nervous System is also in charge of organism functions regulation, but unlike the Sympathetic, this one acts to respond to situations of calm and relaxation, such as resting periods after physical activity, or even resting pauses during the practice. The specific functions assigned to the parasympathetic system are to decrease the heart beating, reduce the arterial pressure, decrease the adrenaline production, as well as the blood sugar levels, and reduce the metabolic rate.

All these actions are, just like in the case of the Sympathetic Nervous System, involuntary.



Bioceramics and your body

The use of bioceramics during the sports practice allows the FIR radiation to act in the Sympathetic and Parasympathetic systems in real time.

What does this mean, in practical terms? The FIR radiation stimulates the parasympathetic system to reduce the metabolic rate during the resting period after sport practice, as well during pauses of practice. Consequently this garment helps increase the cardiorespiratory recovery, allowing a more efficient recuperation and consequently a better performance.

Besides the improvement in the Parasympathetic Nervous System, ntextile generates a better energetic efficiency by the usage and redirecting of the heat generated by the organism and released by the skin, reducing skin temperature as well as body temperature, helping to the increase of physical endurance.

The sympathetic system, on the other hand, is more responsive in an active way, helping the organism correspond promptly and appropriately to the physical effort that is demanded during sports practice, by an optimization of the metabolic activation, meaning that there is a balance acceleration of the heartbeat, leading to an appropriate irrigation to all the organs, as well as an appropriate response by the respiratory system. All these responses lead to an increase in the physical ability to endure effort, resulting in yet another optimization to the use of physical activity and its advantages.

The use of these garments for sports practice leads to a lower skin temperature, and consequently a better thermic balance. This happens because the energy emitted by the body is not kept in the fiber, but returned as FIR radiation, working like a mirror.

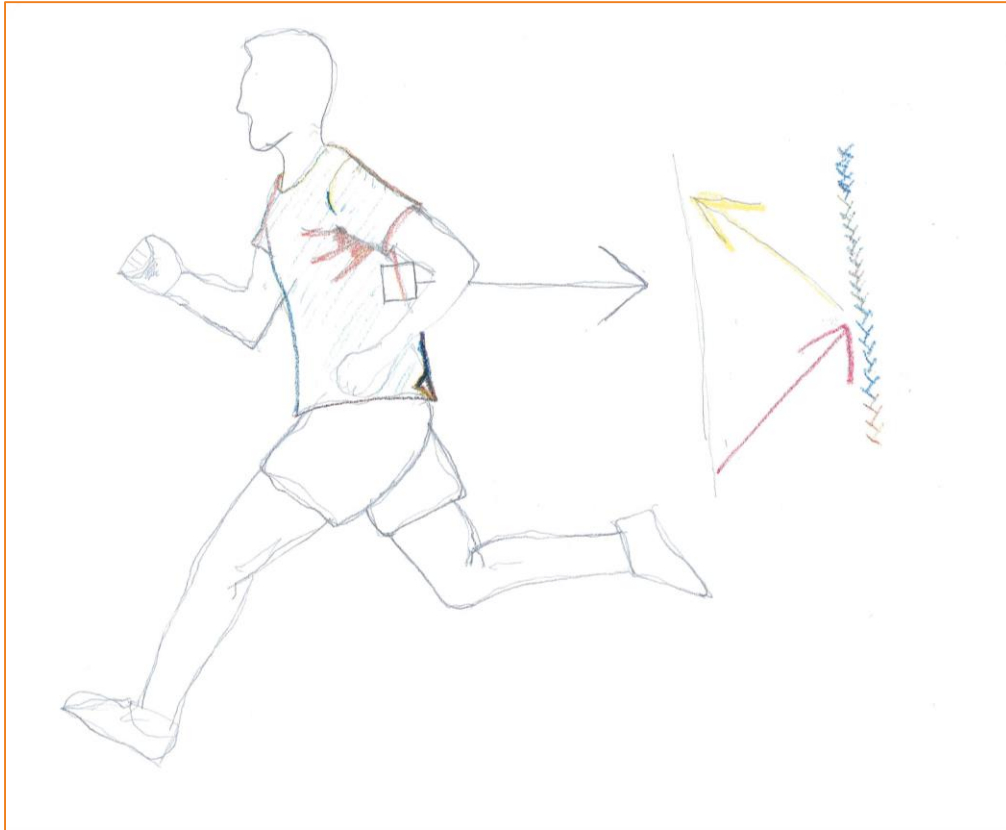


Blood Flow During Sports

By an optimization of micro-circulation on a cellular level, the organism keeps itself more irrigated and the cellular system more functional. As a consequence, the use of clothing embedded with ntextile during sports practice helps reducing tiredness and muscular fatigue. Consequently, on a long-term, muscle mass develops in a balanced rhythm, and quicker at the same time.

This sum of factors makes the sports practice become a more pleasant experience, as well as more sustainable for health.

FIR radiation in sports practice



Well being



Sleep

nTextile improves the quality of sleep with the use of sheets and pillows impregnated with bioceramics fibers, by promoting muscle relaxation as well as an improvement on blood circulation, inducing a calm resting.

With the regular use of nTextile, it is possible to verify short and long term improvements in the circulatory system thanks to the action of FIR radiation on the endothelium level - a thin cellular layer placed in the interior surface of blood vessels.



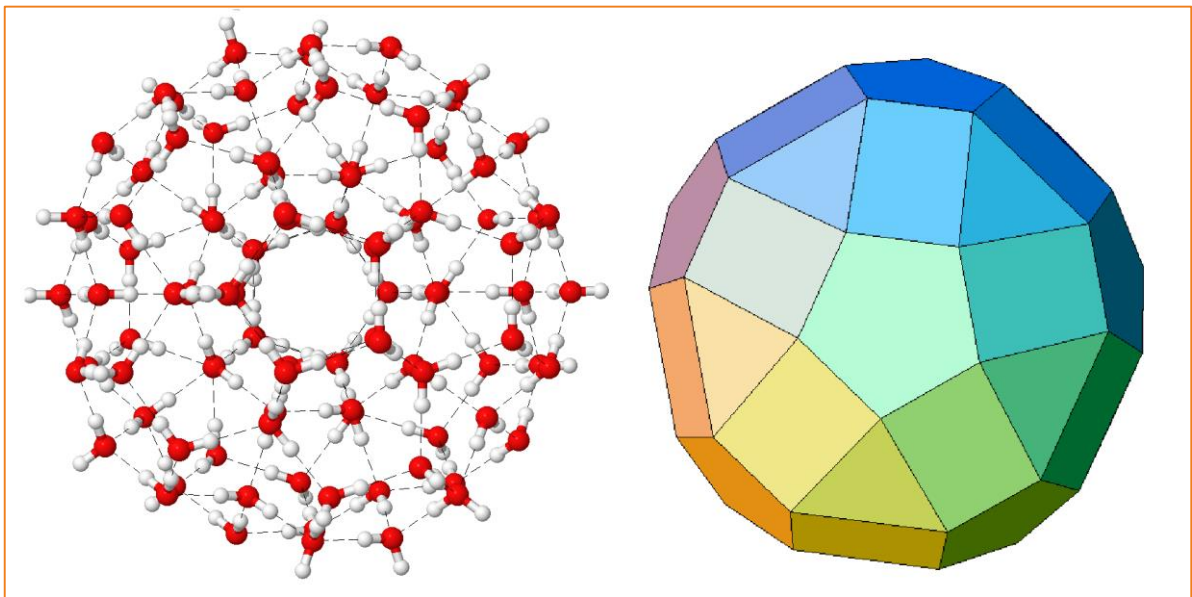
Water retention and weight loss

nTextile helps reduce water retention inside the body, which is responsible for so many health and well-being problems. This occurs because this radiation acts on the water clusters in the molecular bonds of these macromolecules, reducing them to its regular dimension of a water molecule, making it easier for it not to get accumulated in unwanted places in the human body.

Consequently of the prevention in water retention, there is a visible cellulite reduction, regardless of practicing physical activity.

All the proprieties in ntextile allow it to, when integrated in belts or girths, provide weight loss thanks to its microcirculation activation as well as the increase of the production of nitric oxide. Nitric oxide in small amounts is benefic in the human body, acting in the organism by promoting muscle relaxation, favoring vasodilation, and creating a redistribution of the blood flow.

FIR radiation in sports practice



Conclusion

- Thanks to its unique combinations of minerals and chemical products, ntextile is safe and efficient. The fact that this product can be applied to any kind of textile brings it a multiplicity of different uses and reaches. Its transversal utility for Health, Well-Being, and Sports reinforces the potential of this product, and its different applicability possibilities make it undeniable in its utility.

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