

# **Biophysical testing of the SPIRO LEVEL 4 regarding the protective effect with electromagnetic radiation**

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## **Abstract**

**Objectives:** This evaluation is aimed to determine the effectiveness of the SPIRO L4 as a protection measure against electromagnetic fields from anthropogenic sources.

**Design:** Using the HRV marker, the International Association for Electromog Research (IGEF) tested the protective effect of the SPIRO L4 against health-endangering disturbances caused by high frequency electromagnetic radiation and electromog.

**Subjects:** 10 test subjects who claimed to be electrohypersensitive, of both genders, with ages between 10 and 76 years, in various test situations.

**Outcome measures:** Heart Rate Variability Index.

**Results:** The results of the biophysical investigation by the IGEF confirmed that the use of the SPIRO L4 with health-endangering disturbances caused by high frequency electromagnetic radiation leads to a verifiable improvement in the heart rate variability, and its positive effect increases with the duration of use.

**Conclusion:** The SPIRO L4 is an effective protection measure against high frequency electromagnetic radiation and its biological effects.

**Keywords:** Heart rate Variability, HRV, EMF, EMF Protection, Electromog, Electropollution, Biomarker, SPIRO, SPIRO Card, NOXTAK, Radiation, EMF, Electromagnetic Radiation, Health, Cellphones, Cellphone Radiation, NOXTAK.

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## **1. Introduction**

Heart Rate Variability is a comprehensive biomarker that can determine multiple affections in the human body. According to Van Ravenswaaij-Arts (1993), the amount of short- and long-term variability in heart rate reflects the vagal and sympathetic function of the autonomic nervous system, so it can be used as a monitoring tool in clinical conditions with altered autonomic nervous system function. In postinfarction and diabetic patients, low heart rate variability is associated with an increased risk for sudden cardiac death. A sympathovagal imbalance is also detectable with heart rate variability analysis in coronary artery disease and essential hypertension. Besides diabetic neuropathy, in many other neurologic disorders, such as brain damage, the Guillain-Barre syndrome, and uremic neuropathy, heart rate variability analysis can provide insight into which division of the autonomic nervous system is most affected.

Heart rate variability can be influenced by various groups of drugs and external influences, and can also shed light on the mode of action of drugs, as well as other environmental influences and pollutants like electromog (EMFs) can, somehow, alter the human body.

EMF is part of the spectrum of radiation, it is, specifically, non-ionizing radiation. The term radiation is poorly understood and is often used as a synonym for something bad or harmful. Radiation, in simple terms, is the propagation of electromagnetic energy in space, there is ionizing and non-ionizing radiation, and radiation from natural sources or from artificial sources.

Electromagnetic radiation from artificial sources is part of the non-ionizing category and, for that reason, was misunderstood for decades and believed to be harmless for biological systems. However, scientific data collected through the last four decades

shows that this disturbed radiation (artificially polarized), when emanating from man-made sources, produces side effects in biological systems, the environment, and even technologies. This disturbed radiation is capable of damaging the electronic circuits in a computer and reducing the lifespan of electronic devices. So, it's the same with the human body, animals, plants, bees, and so on.

Yildiz and Yilmaz (2010) studied the effects of electromagnetic fields (EMFs) emitted by GSM900 based mobile phones on the heart rate variability by using nonlinear analysis methods. The largest Lyapunov exponent calculation was used to evaluate the effect of mobile phones under various real exposure conditions in sixteen healthy young volunteers. They concluded that high level EMF changed the complexity of cardiac system behavior significantly.

Also, Andrzejak (2008) performed a study aimed to estimate the influence of the call with a mobile phone on heart rate variability (HRV) in young healthy people. The time and frequency domain HRV analyses were performed to assess the changes in sympathovagal balance in a group of 32 healthy students with normal electrocardiogram (ECG) and echocardiogram at rest. The tone of the parasympathetic system measured indirectly by analysis of heart rate variability was increased while sympathetic tone was lowered during the call with use of a mobile phone. It was shown that the call with a mobile phone may change the autonomic balance in healthy subjects. Changes in heart rate variability during the call with a mobile phone could be affected by the electromagnetic field.

As heart rate is modulated by the autonomic nervous system, study of HRV can be used for assessing the neurological effect. In this order, Thajudin (2008) studied the neurological effect of electromagnetic fields radiated from mobile phones by studies on heart rate variability (HRV) of 14 male volunteers. The parameters used in the study for quantifying the effect on HRV are scaling exponent and sample entropy. The result indicated an increase in both the parameters when the mobile phone is kept close to the chest and a decrease when kept close to the head. Mobile phones have caused changes in HRV indices and the change varied with its position.

SPIRO® (Spin Radiation Organizer Technology) is a nanocomposite material that produces an effective protective effect against electro-pollution. Its operation happens by nanomagnetism, under the principle of passive filtering, achieved by promoting a natural organization of the spins on those particles spreading in the environment and interacting with SPIRO®. Its nanomagnetic effect functions by transferring the nanomagnetism of the material to the particles present in the environment and the space in which it is found, and, as a consequence, it neutralizes the disturbance present in the radiation, eliminating the chaos and imbalance of artificially polarized charges at the fundamental level. With this, it promotes a natural magnetic ordering of spins in the radiation, which consequently exhibits the same behavior of natural electromagnetic fields at the fundamental level.

The use of SPIRO® promotes a recovery of the body's bioelectric system, improving the function and healthy

communication of cells in the body. This happens when the electrical potential in the cell membrane stabilizes the abnormal opening of the voltage-gated ion channels of the membrane. This process of cellular detoxification and restoration happens gradually and recovery time varies according to each case, having the best results for those individuals who also evaluate their environments and protect themselves from other environmental toxins. SPIRO® is also a viable solution for individuals with electro-stress or electro hypersensitivity (EHS).

## **2. Materials & Methods**

### **2.1. The selection of the heart rate variability measurement as a diagnostic system for the investigation.**

The vegetative nervous system dynamically controls the internal balance of the organism, depending on the momentary external and internal loads. The heart reacts to stimuli that are consciously perceived and to consciously imperceptible stimuli, which are generated for example by electromagnetic ambient radiation and act on the vegetative nervous system. The heart rate variability of a healthy person is essentially based on the optimum interplay between the sympathetic and the parasympathetic components of the vegetative nervous system.

The heart is an electromagnetic power source of 2.4 Watts, the oscillations of which can be measured in the tiniest cell of the organism. All rhythms of life are reflected in the heartbeat. If these rhythms are in harmony, in coherence, then we experience a sense of well-being. The measurable primary variable of this information chain is the heart rate variability (HRV), which is the most important parameter for the accurate assessment of well-being and vitality.

Heart rate variability is defined as the ability of an organism (human, mammal) to alter the frequency of the heart's rhythm. Even when in a resting state, spontaneous changes arise in the temporal interval between two heartbeats. A healthy organism constantly adjusts the heart rate to the momentary requirements via autonomous physiological regulatory pathways. Physical demands and psychological stresses are therefore known to generally cause an increase in the heart rate, which usually returns to the normal rate when the strain or stress is alleviated. A greater ability to adjust to stresses and strains therefore exists if the heart rate variability is higher. In contrast, in the event of chronic stress the constantly high tension results in both of these characteristics being restricted to a greater or lesser degree, and therefore being reduced.

Debilitating or harmful effects, such as those from high frequency mobile telephony radiation and low frequency electrosmog, are commonly recognised by the nervous system as vital threats. If the organism is subjected to constant loads by interference fields then it is not able to normalize these stress parameters and they lead to a reduction in the heart rate variability; i.e. the ability of the organism to adjust to changing parameters within the environment is reduced. As a result of this interrelation, the protective effect of a product or an action can be verified by measuring the heart rate variability.

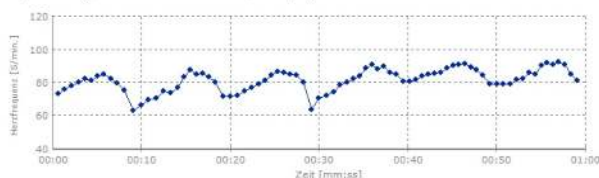
The spontaneous stimulation of the vegetative nervous system by electromagnetic radiation and energy fields generally lies well below the threshold value that is physically perceptible. However, the sensitive measuring equipment of modern biofeedback systems also logs the tiniest reactions of the vegetative nervous system control, in particular via the parameters of heart rate variability. In scientific research, the reproducibility of the results of modern measuring devices for heart rate variability has also been confirmed with short testing time frames.

Measurement of the heart rate variability was therefore selected as a diagnostic system, in order to assess whether the energetic information field of the SPIRO LEVEL 4 leads to an improvement in the heart rate variability of the test subjects, and is therefore able to contribute to an increase in the individual ability of the biological system to adjust.

The use of the SPIRO LEVEL 4 with health-endangering disturbances due to high frequency electromagnetic radiation and electrosmog should therefore lead to a verifiable improvement in the heart rate variability, whilst also promoting the heart and circulatory system processes and reducing the work of the vegetative nervous system required in order to maintain the internal balance.

## **2.2. The energetic effect of the SPIRO L4 in conjunction with the biofeedback system Stress Pilot Plus.**

In this study, the change in the physiological signals of a test subject group was logged as feedback from the vegetative nervous system to the bioenergetic information of the SPIRO Level 4 through the measurement of the heart rate variability and this data was evaluated according to mathematical-statistical processes.



Optimum regulation of the heart rate

During this measurement of the heart rate variability, the breathing and heartbeat balance with each other in the case of well-functioning neurovegetative regulation.

The heart rate oscillates up and down in harmony with the breathing rhythm, in a sinusoidal form. The greater the fluctuation of the heart rate within the breathing cycle (significant respiratory sinus arrhythmia; RSA), the better the neurovegetative regulation in general terms.

The function of the autogenous nervous system lies in adjusting the basic regulation of the biological system to changing load parameters both internally and externally. Health, well-being and functional vitality are inextricably linked with the regulation processes and the rhythms of life, which are reflected in the heartbeat.



Restricted regulation of the heart rate

Neurovegetative regulation disturbances are expressed in this measurement through a minimal or lack of adjustment of the heart rate to the breathing rhythm. The heart rate only oscillates in harmony with the breathing cycle to a very slight degree, and in some instances not at all. With increasing age, the ability to regulate also diminishes. The results of the heart rate variability measurement are therefore related to the respective age group.

## **2.3. Selection of the test subjects and selected measurement log.**

10 test subjects of both genders who are exposed to a customary modern level of electromagnetic radiation were selected for participation in this biophysical investigation. The ages of the test subjects range between 10 and 76 years. The test subjects selected were all persons who - in their own opinion - react sensitively to electrosmog. The heart rate variability measurements were taken in the apartments or at the workplaces of the test subjects. The measurements were taken in advance of using the SPIRO Level 4 and then once again after a few days spent using the SPIRO Level 4.

## **2.4. Selected measuring device.**

The biofeedback system *Stress Pilot Plus* was used in order to biophysically test the energetic effects of the SPIRO LEVEL 4. The values of the last respective minute of each period were drawn upon for the statistical evaluation. The test results were compared with standard values, which were obtained from a comparable normal control group according to age and gender.

The varying ability of the test subjects to regulate the heart rate and to adjust the vegetative nervous system to the existing disturbances caused by electrosmog is determined by applying the percentage value of the poorest values derived from a comparison group. Accordingly, 0% is the lowest value and 100% is highest theoretical value indicating the ability of the test subject to regulate the heart rate and adjust the vegetative nervous system to the existing disturbances caused by electrosmog.

## **2.5. Explanation of the measurement log parameters.**

RSA = The respiratory sinus arrhythmia (RSA) describes the fluctuation of the heart rate in harmony with the breathing rhythm. Upon inhalation the heart rate rises. When the breath is exhaled the heart rate decreases.

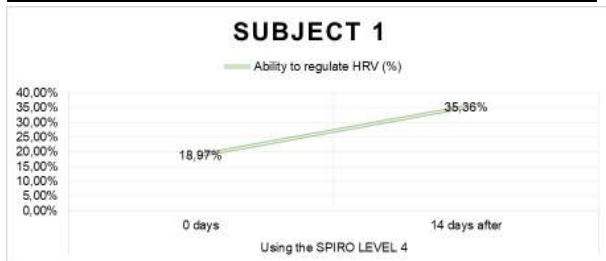
**3. Results**

According to the evaluation, the ability of the test subjects to regulate the heart rate and to adjust the vegetative nervous system to the existing disturbances caused by electrosmog in this test situation and within the comparison group attained the following values of the theoretical maximum value of 100%:

**3.1. Test Subject 1**

Female, high-frequency radiation exposure in the apartment due to a mobile phone transmitter at a distance of approx. 100 meters and WLAN in the neighboring apartments. The SPIRO Level 4 was placed beneath the bed.

Parameter	Using the SPIRO LEVEL 4	
	0 days	14 days after
Resp. sinus arrhythmia (bpm)	5.99	13.1
Ability to regulate HRV (%)	18.97%	35.36%



Subject 1: Without the SPIRO Level 4



Subject 1: After 14 days using the SPIRO Level 4

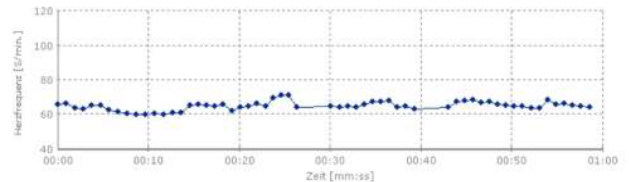
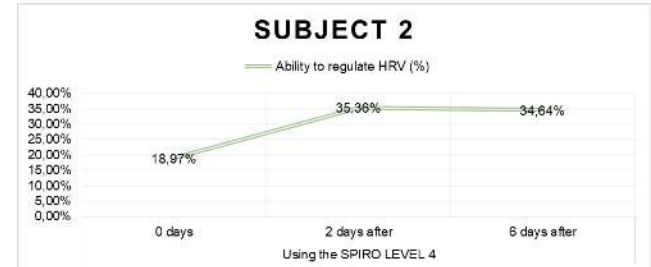
With this test subject, the use of a SPIRO Level 4 during the 14-day test phase led to an age group-related improvement in the variability of the heart rate from 19.0% to 35.4%. It is therefore possible to assume a significant reduction in the chronic stress caused by high-frequency electromagnetic radiation.

**3.2. Test Subject 2**

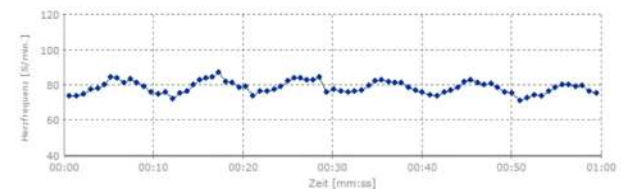
Male, high-frequency radiation exposure in the apartment due to a constantly pulsing DECT cordless phone. The power line to the house runs across the roof, directly above the bedroom.

The SPIRO Level 4 was placed in the living room during the day and beneath the bed at night.

Parameter	Using the SPIRO LEVEL 4		
	0 days	2 days after	6 days after
Resp. sinus arrhythmia (bpm)	5.99	13.1	10.12
Ability to regulate HRV (%)	18.97%	35.36%	34.64%



Subject 2: Without the SPIRO Level 4



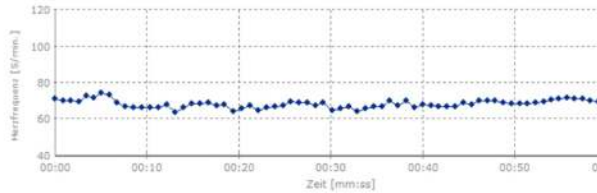
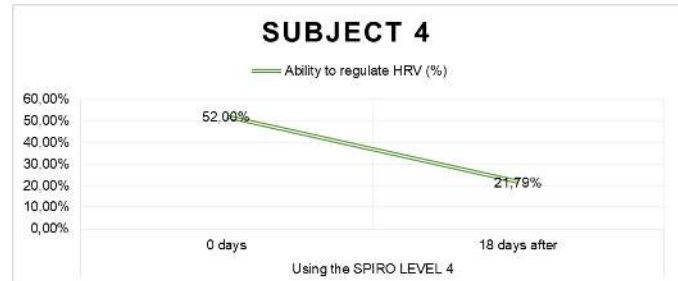
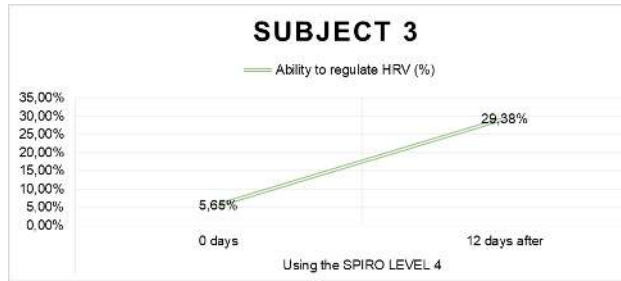
Subject 2: After 6 days using the SPIRO Level 4

With this test subject, the use of a SPIRO Level 4 during the 6-day test phase led to an age group-related improvement in the variability of the heart rate from 2.2% to 34.6%. It is therefore possible to assume a significant reduction in the chronic stress caused by high-frequency electromagnetic radiation.

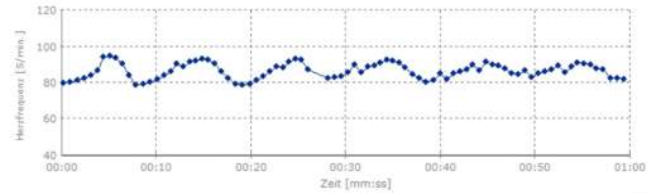
**3.3. Test Subject 3**

Male, exposure in the apartment due to high-frequency signals from WLAN and mobile phone in an office beneath the apartment. The SPIRO Level 4 was placed in the living room beneath the dining table.

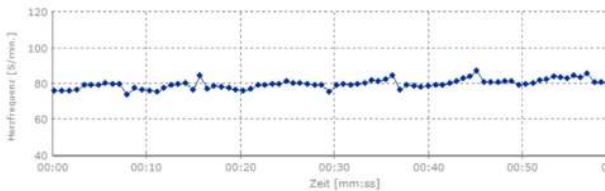
Parameter	Using the SPIRO LEVEL 4	
	0 days	12 days after
Resp. sinus arrhythmia (bpm)	5.11	7.72
Ability to regulate HRV (%)	5.65%	29.38%



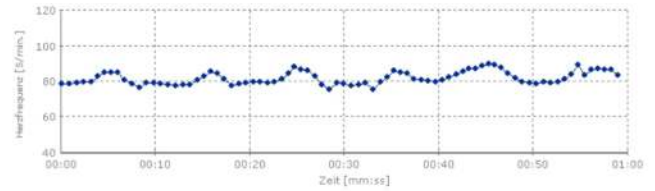
Subject 3: Without the SPIRO Level 4



Subject 4: Without the SPIRO Level 4



Subject 3: After 12 days using the SPIRO Level 4



Subject 4: After 18 days using the SPIRO Level 4

With this test subject, the use of a SPIRO Level 4 during the 12-day test phase led to an age group-related improvement in the variability of the heart rate from 5,6% to 29,6%. It is therefore possible to assume a significant reduction in the chronic stress caused by high-frequency electromagnetic radiation.

The ability of the subject to regulate the heart rate after days using SPIRO Level 4 and to adjust the autonomic nervous system to the existing burden of electromog worsened from previously 52.0% after 18 days to 21.8%. It must be concluded that the SPIRO Level 4 adverse effect on this subject on the cardiovascular processes and the autonomic nervous system. In this subject, the regular intake of a drug may have caused a blocking effect on the blood pressure damping.

### 3.4. Test Subject 4

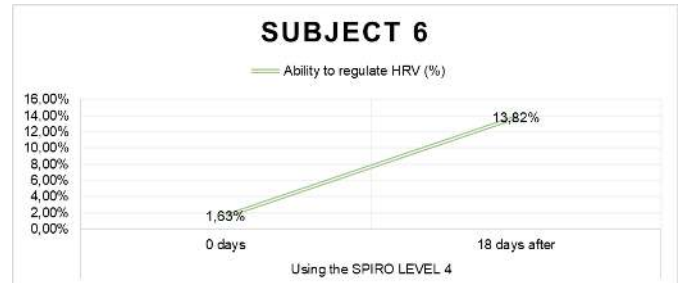
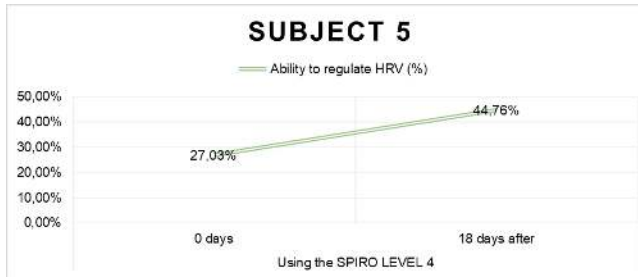
Female, high-frequency radiation exposure in the loft apartment due to a mobile phone transmitter at a distance of approx. 200 meters. A SPIRO Level 4 was placed in the parents' bedroom under the bed shared by test subject 4 and test subject 5. A further SPIRO Level 4 was placed in the neighboring child's bedroom, under the bed of test subject 6.

Parameter	Using the SPIRO LEVEL 4	
	0 days	18 days after
Resp. sinus arrhythmia (bpm)	12.09	10.87
Ability to regulate HRV (%)	52.00%	21.79%

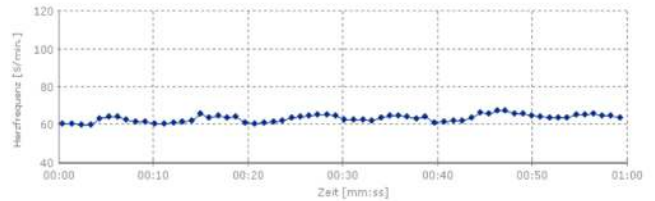
### 3.5. Test Subject 5

Male, high-frequency radiation exposure in the loft apartment due to a mobile phone transmitter at a distance of approx. 200 meters. A SPIRO Level 4 was placed in the parents' bedroom under the bed shared by test subject 4 and test subject 5. A further SPIRO Level 4 was placed in the neighboring child's bedroom, under the bed of test subject 6.

Parameter	Using the SPIRO LEVEL 4	
	0 days	18 days after
Resp. sinus arrhythmia (bpm)	6.71	10.35
Ability to regulate HRV (%)	27.03%	44.76%



Subject 5: Without the SPIRO Level 4



Subject 6: Without the SPIRO Level 4



Subject 5: After 18 days using the SPIRO Level 4



Subject 6: After 18 days using the SPIRO Level 4

With this test subject, the use of a SPIRO Level 4 during the 18-day test phase led to an age group-related improvement in the variability of the heart rate from 27,0% to 44,8%. It is therefore possible to assume a significant reduction in the chronic stress caused by high-frequency electromagnetic radiation.

With this test subject, the use of a SPIRO Level 4 during the 18-day test phase led to an age group-related improvement in the variability of the heart rate from 1,6% to 13,8%. It is therefore possible to assume a significant reduction in the chronic stress caused by high-frequency electromagnetic radiation.

### 3.6. Test Subject 6

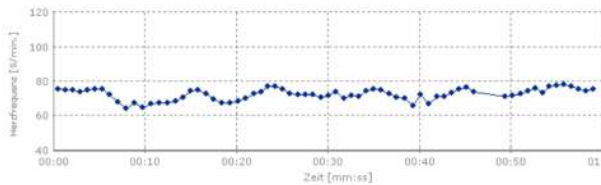
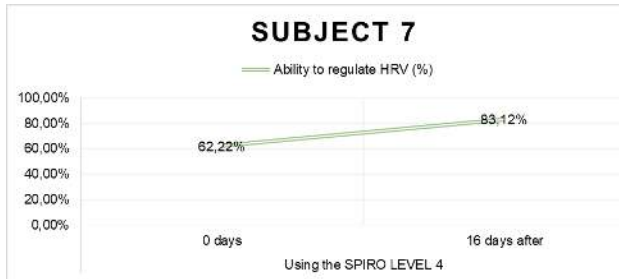
Male, high-frequency radiation exposure in the loft apartment due to a mobile phone transmitter at a distance of approx. 200 meters. A SPIRO Level 4 was placed in the parents' bedroom under the bed shared by test subject 4 and test subject 5. A further SPIRO Level 4 was placed in the neighboring child's bedroom, under the bed of test subject 6.

### 3.7. Test Subject 7

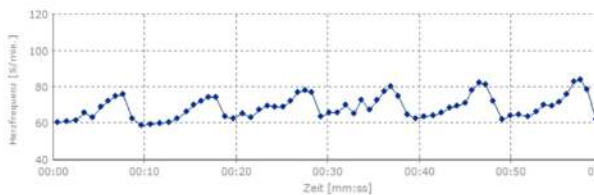
Female, very high-frequency radiation exposure due to two constantly pulsing DECT cordless phones in the apartment. A SPIRO Level 4 was placed in the bedroom beneath the bed.

Parameter	Using the SPIRO LEVEL 4	
	0 days	18 days after
Resp. sinus arrhythmia (bpm)	4.48	5.14
Ability to regulate HRV (%)	1.63%	13.82%

Parameter	Using the SPIRO LEVEL 4	
	0 days	16 days after
Resp. sinus arrhythmia (bpm)	9.21	18.12
Ability to regulate HRV (%)	62.22%	83.12%



Subject 7: Without the SPIRO Level 4



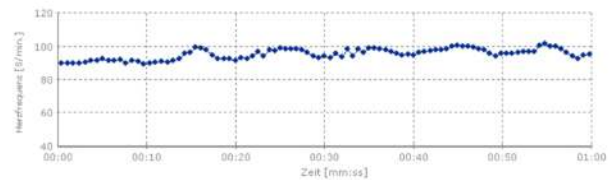
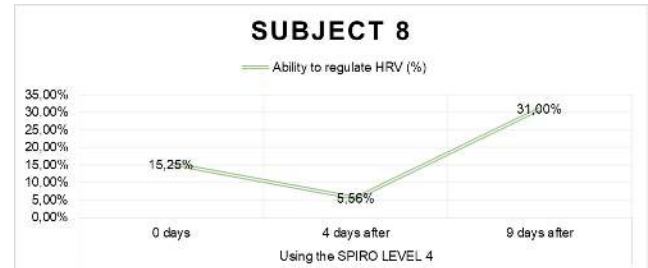
Subject 7: After 16 days using the SPIRO Level 4

With this test subject, the use of a SPIRO Level 4 during the 16-day test phase led to an age group-related improvement in the variability of the heart rate from 62,2% to 83,1%. It is therefore possible to assume a significant reduction in the chronic stress caused by high-frequency electromagnetic radiation.

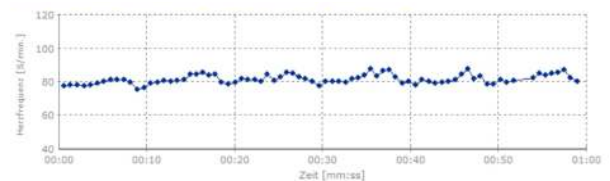
### 3.8. Test Subject 8

Male, high-frequency radiation exposure in the apartment and in the workplace due to a mobile phone transmitter and airport radar. A SPIRO Level 4 was placed in the bedroom beneath the bed and a further unit was used after 4 days in the workplace, on the desk.

Parameter	Using the SPIRO LEVEL 4		
	0 days	4 days after	9 days after
Resp. sinus arrhythmia (bpm)	7.54	8.78	8.35
Ability to regulate HRV (%)	15.25%	5.56%	31.00%



Subject 8: Without the SPIRO Level 4



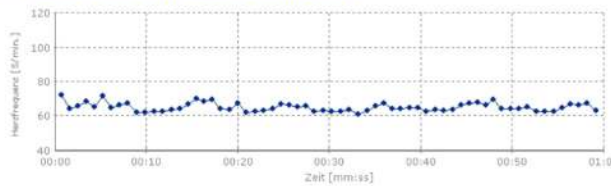
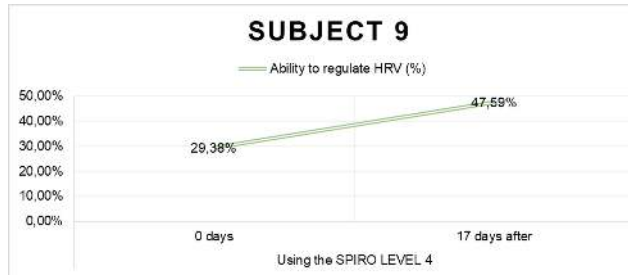
Subject 8: After 9 days using the SPIRO Level 4

With this test subject, the use of a SPIRO Level 4 during the 9-day test phase led to an age group-related improvement in the variability of the heart rate from 15,2% to 31,0%. It is therefore possible to assume a significant reduction in the chronic stress caused by high-frequency electromagnetic radiation.

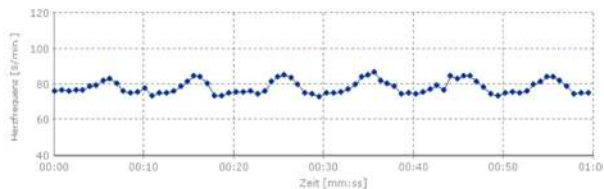
### 3.9. Test Subject 9

Male, very high-frequency radiation exposure in the apartment due to multiple constantly pulsing DECT cordless phones in the neighboring apartments. A SPIRO Level 4 was placed in the living room on a wooden table during the evening, and in the bedroom beneath the bed at night.

Parameter	Using the SPIRO LEVEL 4	
	0 days	17 days after
Resp. sinus arrhythmia (bpm)	6.88	12.54
Ability to regulate HRV (%)	29.38%	47.59%



Subject 9: Without the SPIRO Level 4



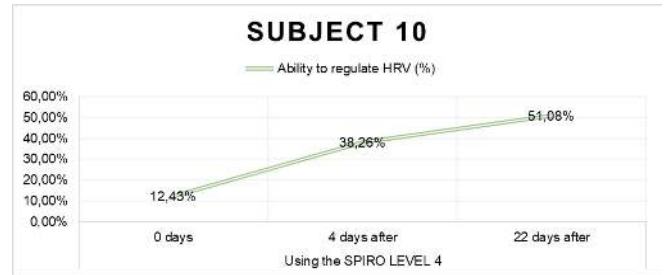
Subject 9: After 17 days using the SPIRO Level 4

With this test subject, the use of a SPIRO Level 4 during the 17-day test phase led to an age group-related improvement in the variability of the heart rate from 29,4% to 47,6%. It is therefore possible to assume a significant reduction in the chronic stress caused by high-frequency electromagnetic radiation.

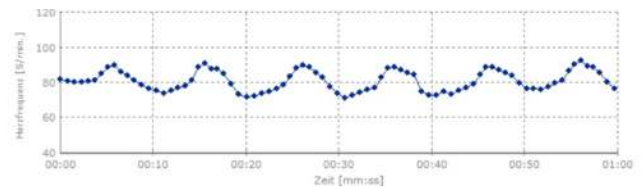
### 3.10. Test Subject 10

Female, very high-frequency radiation exposure due to a constantly pulsing DECT cordless phone in the apartment and a mobile phone transmitter at a distance of approx. 150 meters. A SPIRO Level 4 was placed in the living room on a table during the day, and in the bedroom beneath the bed at night.

Parameter	Using the SPIRO LEVEL 4		
	0 days	4 days after	22 days after
Resp. sinus arrhythmia (bpm)	7.26	10.74	8.44
Ability to regulate HRV (%)	12.43%	38.26%	51.08%



Subject 10: Without the SPIRO Level 4



Subject 10: After 22 days using the SPIRO Level 4

With this test subject, the use of a SPIRO Level 4 during the 22-day test phase led to an age group-related improvement in the variability of the heart rate from 12,4% to 51,1%. It is therefore possible to assume a significant reduction in the chronic stress caused by high-frequency electromagnetic radiation.

## 4. Conclusions

In 5 of the 10 test subjects, the use of the SPIRO Level 4 **clearly** improved the ability to regulate the heart rate and adjust the vegetative nervous system to various exposure levels.

In 4 of the 10 test subjects, the use of the SPIRO Level 4 **significantly** improved the ability to regulate the heart rate and adjust the vegetative nervous system to various exposure levels. The measurement results were primarily confirmed through the descriptions of the test subjects of their subjective perception of the reactions of their bodies to the bioenergetic information field of the SPIRO Level 4.

In 1 of the 10 test subjects, the use of the SPIRO Level 4 was **ineffective** in terms of heart rate regulation. In the case of this individual, it is possible that the regular use of medication for reducing blood pressure may have had a blocking effect.

The results of the biophysical investigation by the IGEF test and research laboratory confirm that the use of the SPIRO LEVEL 4 with health-endangering disturbances caused by high

frequency electromagnetic radiation leads to a verifiable improvement in the heart rate variability. This has a beneficial effect on the heart and circulatory system processes and reduces the work of the vegetative nervous system required in order to maintain the internal balance. The measurement results show that the positive effect of the SPIRO LEVEL 4 increases with the duration of use.

The SPIRO LEVEL 4 is therefore suitable as a protective measure with electromagnetic radiation. However, use of the SPIRO LEVEL 4 cannot replace medical treatment in the event of illness.

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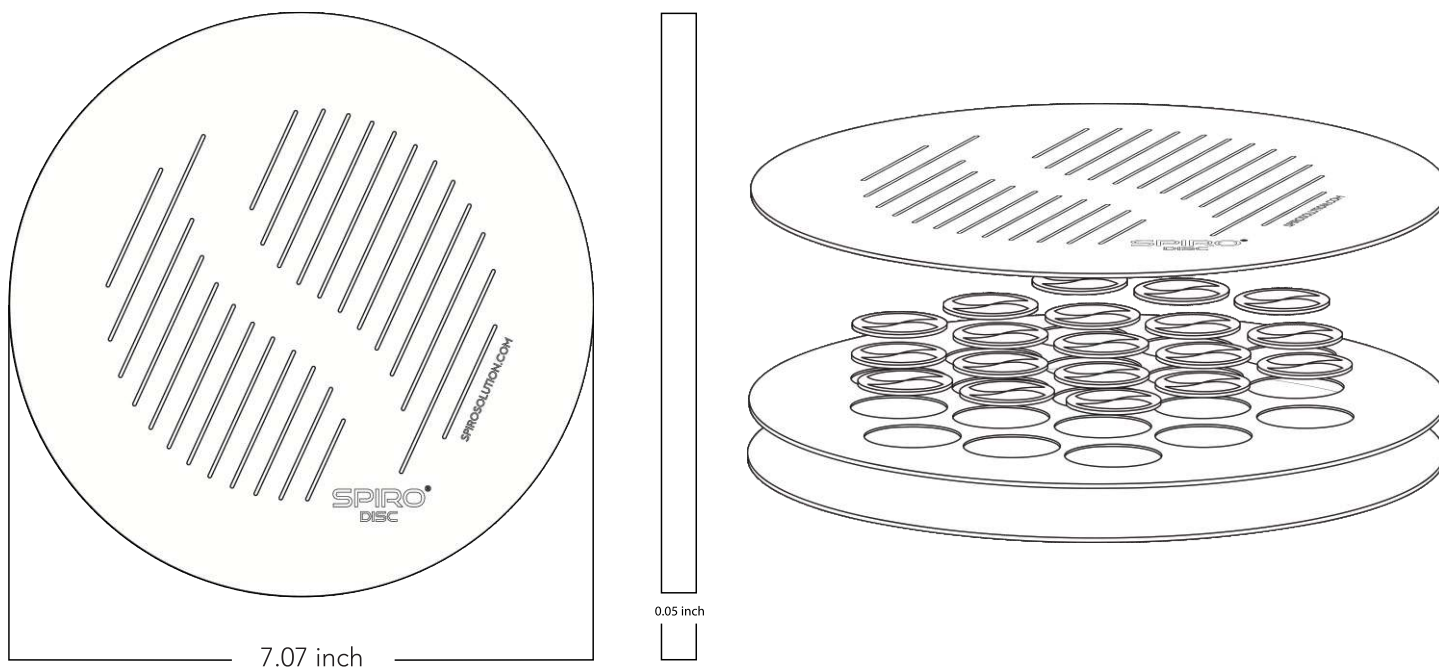
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## **Annex**

## DATASHEET



### Multifrequency Filter Protection of RFR / ESD / LF Magnetic Flux

#### MADE FOR:

3G, 4G, LTE, 5G (Sub6), WiFi 2.4/ WiFi 5, Wifi 6, Bluetooth 5  
Home & Office Spaces with multiple devices working simultaneously, Electrical Panels, Smart Meters, EV Cars, Hybrid Cars.

#### SIZE AND WEIGHT

Size: 7.07 inch  
Thickness: 0.05 inch  
Weight: 1.4 oz

#### TECHNICAL SPECIFICATION

- SPIRO® Filtering Power: 6.3 (19 SPIRO® Films)
- Power Density RFR: 4.59 mW/cm<sup>2</sup>
- AC Electrical Field Capacity: 6.80 v/m (ELF)
- AC Magnetic Flux: 189 mG / 18.9 uT
- Durability: 7 years (test in process)
- Range of Action Radius: 23.6 ft (Spherical)
- Range of Action Diameter: 47.24 ft (Spherical)
- General Area of Influence: 1753.02 ft<sup>2</sup>
- Film Frequency Range: 0 Hz to 1 x 10<sup>15</sup> Hz (10 Thz)
- Films Curie Temperature: 1011.2 °F (544 °C)
- Made for Telecommunications from 0.3 GHz to 25 Ghz

For support, visit [www.spirosolution.com](http://www.spirosolution.com)