Independent Non-Commercial Organization
Center of Scientific-and-Technical and Social-and-Cultural Initiatives
“Valcon”

Report

for Contract # 03/01 “Development of the Test-Analyzer for demonstration of harmful electromagnetic radiation of mobile phone and LCD-monitors, and protective effect of Neitronik”

The investigation was performed by:
prof. Simakov Yu.G., Doctor of Biology

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Introduction

Today, we can find hundreds of scientific publications which confirm harmful effect of electromagnetic radiation, emitted by mobile phones and LCD monitors, for human organism and other living beings. Hence, it has become essential to create a special device, namely Test-Analyzer, which could indicate harmful effect of electromagnetic radiation, emitted by mobile phones and LCD monitors. Moreover, this device demonstrates that personal protective devices, in our case Neitronik, provide reduction of electromagnetic smog and bioinformational pollution, generated near mobile phones and monitors.

From our point of view, harmful electromagnetic radiation can be more effectively revealed by living organisms, sensible to such kind of radiation, rather than by physical instruments. In order to confirm this proposition, we have performed a series of runs during which bacteria, protozoa and crystalline lens epithelium tissue (which is a pure culture of eye cells) of rats were exposed to radiations, generated by mobile phones and PC monitors [1-4].In all these cases, harmful effect of electro-magnetic radiation was revealed. Before that, the effect of application of personal protective devices which reduce harmful effect of electro-magnetic radiation was investigated.

Thus, the Test-Analyzer, developed by us, should represent a bioindicative instrument sensible to harmful radiation of mobile phones and LCD-motors. As a bioindicator, we recommend to use free dense culture of saprophytic bacteria and protozoa, forming microbiocoenosis in fresh water bodies. Such bioindicators are completely harmless for people and animals, which complies with one the most important requirements to the ecological and microbiological safety of the Test-Analyzer.

After all, such “alive” instrument is able to visualize EMR exposure and demonstrate effect of protective device Neitronik without any complementary optical instruments. Redistribution of plaque and protozoa formations happens in 2-3 minutes of EMR exposure, generated by mobile phones and LCD monitors. Observations of this process show both harmful radiation exposure and Neitronik effectiveness for protection of living organisms.

1. General Features of Test-Analyzer

1.1. Test-Analyzer is based on biological properties of stable assemblages of microorganisms. This assemblages represent biocoenosis of bacteria, protozoa and rotatories. These microorganisms are able to form patterns of zooglea formations in the thin layer spread over the bottom of the Petri dish when being exposed to electromagnetic field (EMF).

1.2. Main characteristics, parameters and features.

1.2.1 The Test-Analyzer indicates changes of directional distribution of microorganisms within 3 minutes of exposure by electromagnetic field (electrostatic field) of mobile phone and LCD monitors. The microorganisms are regularly spread in the thin layer of water (4 mm) on the bottom of the Petri dish. When being exposed by EMR of electronic devices, the microorganisms form pattern of zooglea formations looking like wheel spokes, whenever out of EMR, the microorganisms with regular or fractional spread of zooglea cover the whole bottom of the dish. The clearness of the pattern is achieved by 5 revolving rocking of the Petri dish by not more the 3 mm. This process slightly resembles to visualization of force lines of magnetic field by spread of the iron chips in it.

1.2.2. The Test-Analyzer includes:

- Glassy bulb with flat bottom (in this case, the Petri dish) enabling demonstration of how waterborne zooglea form patterns under electromagnetic radiation.
- Carrier – water with 10% of stable microbiocoenosis, in which aerobic microbiological processes take place. The microorganisms get organic nutrition by "self-eating" its own bacteria, that is why this microecosystem can stay alive without any nutrient medium. The aerobic stabilization is quite a long-standing process, thus microorganisms can stay alive within not less than 2 months. Life conservancy of microorganisms can be enabled when storing the Test-Analyzer in the refrigerator at a temperature of +3-5^{o}C.

1.2.3. The Analyzer looks like glassy bulb with horizontal bottom and cover enabling observations of the microorganism patterns on the bottom. For particular purposes, plastic or glass Petri dish can be applied. Different modifications of the Petri dish are suitable: the bulb filled with constantly stabilized microorganism sediment and having the fixed cover and the bulb having removable cover. The Petri dish with removable cover should be filled with microorganism each time when EMR effect and protective features of Neitronik are going to be demonstrated.

1.2.4 The dimensions of the Test-Analyzer are as follows:

- height of the round glassy bulb – 10mm;
- diameter of the bulb – 40 mm.

The bulb should be filled with water with 10% of suspended microorganisms including saprophytic bacteria, protozoa and rotatories. The layer of water should be 4 mm above the bottom level.

The bulb should be placed onto the cardboard card with dimensions of 50x90 mm. The card should be white In order to increase the contrast of dark-colored pattern formed by microorganisms. The back side of the card should contain the guidelines for the Test-Analyzer application. The density of the cardboard should be not less than 200 g/m^2.

1.3. The Requirements to the materials and purchased parts

The Test-Analyzer is produced of the following materials: non-toxic glassy plastic, designed for Petri dishes production, or the glass designed for chemical glassware production.

The card should be made of non-toxic cardboard. The instruction should be printed with non-toxic paint.

1.4. Reliability

The test-analyzer has the following reliability indicators:

1) T_{CL} – complete operational life for instrument filled with microorganisms – not less than 2 months.
2) T_A – average shelf life (before putting into service) without microorganisms – 5 years.

1.5 Completeness of Set

The scope of delivery for the Test-Analyzer includes:

1. The Test-Analyzer (bulb).
2. 250 ml of 10% water suspension of stabilized microorganisms (for 50 measurements).
3. Cardboard card (50x90 mm) with guidelines.

Marking and package should comply with the Technical Specification.

2. Safety of the Test-Analyzer

2.1. The Test-Analyzer was developed in accordance with all Standards and Rules enlisted in the Technical Specification.

2.2. The Test-Analyzer should be stored in accordance with specified conditions.

3. Application of the Test-Analyzer and Environment Protection

The Test-Analyzer application cannot result in inadmissible chemical, radiation, electromagnetic, thermal and biological influence on the environment, because this Test-Analyzer does not contain toxic and radioactive agents or EMR sources.

From the point of view of biological safety, the Test-Analyzer does not constitute a hazard because the applied bioindicators fall into the saprophyte microorganisms which can be found in all the surface water bodies used for

recreative purposes. Stabilized microbiocoenosis of bacteria, protozoa and rotatories occurs in biofilters used for water purification in fish aquariums. Microbiological and sanitarian investigations showed that it doesn't imply general viral, bacteria and protozoa disorders for human and fish that is why the Test-Analyzer is completely harmless from the biological and ecological point of view. Being properly used as intended, the Test-Analyzer does not imply toxic and fire danger.

4. Tests of the Test-Analyzer

4.1 The Test-Analyzer has passed necessary acceptance and sampling tests in compliance with the requirement stated in sections 4.1.1-4.1.8 of the Technical Specification.

4.2 The scope and the succession of the tests are given in Table 1 below.

Table 1.

Test	acceptance	sampling	Code # (TU)	Method
Completeness check	+	+	1.6	5.2.1
Check of the design documents	+	+	1.1.3	5.2.2
Check of applied materials and components	+	+	1.3	5.2.3
Content, quality and correctness of the operational documents	+	+	1.1.4 1.5	5.2.4
Check of the bulb dimensions	+	+	1.2.3	5.2.5
Check of the effect of external EMR source (GSM)	+	+	4.1.8	5.2.13
Check of the effect of the monitor EMR	+	+	4.1.8	5.2.13
Check of the effect of external EMR source (GSM) with Neitronik	Visually	+	1.2.3	5.2.6
Check of the effect of the monitor EMR with Neitronik	Visually		1.2.6-1.2.7	5.2.7
Check of the safety processes	-	+	1.2.10	5.2.8
Check of the attributes compliance	-	+	1.2.11	5.2.10
Check of the marking and package compliance	+	-	1.7.1.8	5.2.11 5.2.12

4.2.2 The performed tests showed that the Test-Analyzer complies with the requirements stated in the Technical Specification attached to the Report.

5. The Test Procedure

5.1.1 Before the tests, the operability of the mobile phones and LCD-monitor was checked. Appropriate measures enabling safety were taken.
5.1.2 The tests were performed under normal environmental conditions as stated in GOST 15895-77.
5.1.3 The reliability of the Test-Analyzer is provided under the following conditions:
- thermal variations – not more than by ±5°C;
- the fluctuation of relative humidity is of no importance;
- pressure changes – not more than by 5%.
5.1.4 When performing tests, the temperature was at constant level relatively its initial meaning: 22±2°C.
5.1.5 The Safety Rules were observed in accordance with GOST 12.3.019-80.

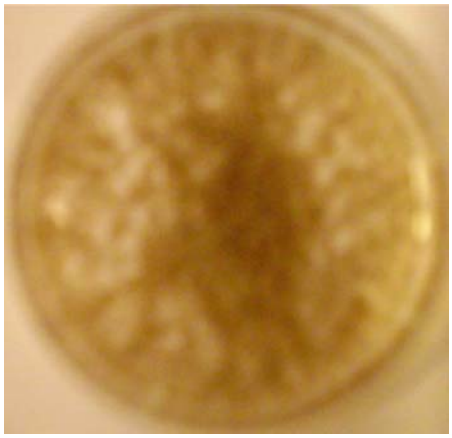
5.2. The Test Procedure

5.2.1 The completeness of the Test-Analyzer complies with the Technical Speciation agreed by the given Contract.
5.2.2 The documents comply with the Technical Specifications.
5.2.3 The applied materials and components comply with the Technical Specifications for the Test-Analyzer.
5.2.4 The prototype was checked with account of the submitted operational documents. The operational documents comply with the prototype.
5.2.5 The dimensions of the Test-Analyzer were checked with the trammel. The check showed that the dimensions are of the acceptable range.
5.2.10 The performed tests were intended to demonstrate the dimensional redistribution of the stabilized microbial sediment containing bacteria, infusoria and rotatories in the glassy bulbs. Each test was performed five-time.
A) The test of the dimensional redistribution of the microbial sediment in the Petri dishes (diameter of 40 mm) under the exposure of the mobile phone EMR within 2 minutes without Neitronik and within 2 minutes with Neitronik. (Picture 1) (The Phone and Neitronik were located in 2 cm from the Petri dish).

Picture 1. The patterns of the microorganisms in the Petri dishes under the mobile phone EMR exposure. a. Without Neitronik. b. With Neitronik

a  b 

B) The Patterns of the microorganisms in the Petri dishes located in 30 cm from the LCD-monitor without Neitronik and with Neitronik are given on Picture 2.
Picture 2. The Patterns of the dimensional redistribution of the microorganism along the Petri dish bottom under the LCD-monitor EMR exposure. a. Without Neitronik. b. With Neitronik.

a  b 

Control: the Petri dish located in 50 cm from the operating mobile phone is shown on Picture 3.

Picture 3. Control: the Petri dish located in 50 cm from the operating mobile phone. The microorganisms are distributed almost regularly along the dish bottom.

5.2.14 Thus, the Test-Analyzer is considered to be operable because the microorganisms in it change their dimensional distribution along the Petri dish within 2-3 minutes under the exposure of the mobile phone or LCD-monitor EMR. The microorganism pattern, typical for EMR exposure, does not occur, when Neitronik is placed near the Test-Analyzer, in case of mobile phone, or at the lower side of the LCD monitor. Hereby, we can see protective effect of Neitronik application.

5. The Test-Analyzer Storage

The Test-Analyzer should be stored in the refrigerator at +2- +4°C and applied in heated rooms at +20±5°C. When being applied, the temperature of the bacteria suspension should be equal to the room temperature.

6. Application directions

The Test-Analyzer can be effectively applied under the conditions as follows:

- Environmental temperature - +20±5°C.
- Atmospheric pressure – 630-680 Hg.
- The Test-Analyzer should be put away from direct solar beams.

Extreme conditions for the Test-Analyzer storage:

- Environmental temperature - +2±32°C.
- Relative humidity - up to 95%.
- Atmospheric pressure – 630-680 Hg.

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Conclusions

We have created the Test-Analyzer based on the biological properties of the stabilized formation of microorganisms, which is a biocoenosis of bacteria, protozoa and rotatories. Patterns of zooglea are formed in the thin water layer on the Petri dish bottom under the exposure of the electromagnetic field (EMF). This shows harmful effect of the electromagnetic radiation of mobile phones and LCD monitors which is equal to poisons effect (like potassium dichromate) and causes cell mutations. When applying protective device Neitronik, the harmful effect reduces by 85%.

The Test-Analyzer was tested in accordance with
the Standards and Regulations as follows:

Regulations

- Provisions of State System of Information Protection in the Russian Federation. Instruction #0126-87.
- Provisions of State Licensing System for Activities in the Sphere of Information Protection #10 of 27.04.1994 and #60 of 24.06.1997, approved by Federal Service for Technology and Export Control (FSTEC) and Federal Agency for Government Communications and Information (FAGCI).
- Ruling Document “Computer-based Systems. Information Protection from Unauthorized Access. Classification of Computer-based Systems and Requirements to Information Protection. Provisions for Assessment of Computer-based Systems. Provisions for Certification of Computer Aids in accordance with the Requirement to Information Security. Certification System”.
- Ruling Document #50-34.698-90 “Guidelines. Informational Technology of Standards and Ruling Documents for Computer-based Systems. Requirements to the Contents of a Document”.
- Guidelines for Certification Tests of Personal Protective Device, based on Holograms.
- SanPiN 2.2.2/2.4.1340-03 “Sanitary Regulations and Standards. Hygienic Requirements to Personal Computers and Labour Arrangement”.
- SanPiN 2.2.4.1191-03 “Electromagnetic Field in Working Environment”.
- SanPiN 2.1.8/2.2.4.1383-03 “Hygienic Requirements to Location and Operation of Transmitting Radio Engineering Objects”.
- SanPiN 2.1.8/2.2.4.1190-03 “Hygienic Requirements to Location and Operation of Terrestrial Mobile Communication Means”.
- PDU 2666-83 “Maximum Acceptable Level for Density of Energy Flux, Generated by Microwave Ovens”.

Standards of Unified System for Program Documentation and Unified System for Design Documentation

- GOST 28147-89 “Data Processing Systems. Cryptographic Protection. Algorithm for Cryptographic Conversion”.
- GOST 34.003-90 “Informational Technology of Standards for Computer-Based Systems. Terms and Definitions”.
- GOST 23773-88 “Digital Computers of General-Purpose. Test Procedure.”
- GOST 24234-80 “Polyethylene Terephthalate Film. Technical Specification”.
- GOST 17-100-79 “Cardboard Cores”.
- GOST 16337-77E “Plastic Cores”.
- GOST V 20.39.304-76 “Climatic Factors Exposure”.
- GOST 24297-87 “Acceptance Test for Goods”.
- GOST 2.114-95 for Unified System for Design Documentation. “Technical Specification”.
- GOST 2.412-81 for Unified System for Design Documentation. “Rules for drawing and drafting works for optical Goods”.
- GOST 40.9003-88. “Quality Systems. Model for Quality Assurance for Final Control and Test”.
- GOST 615.211-78 “Procedure for Programming and Test Methodic Preparation for Prototypes of Goods”.
- GOST 14192-96 “Marking of Goods”.
- GOST 15895-77. “Statistic Methods for Quality Managements. Terms and Definitions”.
- GOST 18251-87 “Sealing Tape with Backing Paper. Technical Specification.”
- GOST 18321-73 “Statistical Quality Control. Methods for Random Sampling of Custom-Made Goods”.
- GOST V 15.210-78 “Test of Prototypes of Goods. General Provisions”.
- GOST V 15.301-80 “Launching into Manufacture. General Provisions”.
- GOST V 15.307-77 “Tests and Acceptance of Stock-Produced Items. General Provisions.”

Additional Materials

1. Simakov Ju.G. *Exposure of cell phone frequencies at miotic activity on crystalline lens epithelium tissue of rats*. // Issues of Biovaleotechnology. # 1, 2001, pp.18-23.
2. Simakov Ju.G., Muraviev A.A. *Pathogenic Microbial Growth after Exposure of PC monitor or EHV self-contained generator*. // Issues of Biovaleotechnology. # 1 (3), 2004, pp.30-35.

3. Simakov Ju.G. *Influence of PC electromagnetic field on Microbial Growth without device "Vita" and with device "Vita"* . // Occupational Health and Industrial Ecology. # 9, 2002.
4. Simakov Ju.G. *Patterns of unicellulate algae formations under influence of microorganisms embedded into cement cubes.*// Autotrophs. Materials of All-Russian Symposium with participation of foreign specialists.