

## ELECTROMAGNETIC SHIELDING MATERIALS

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Our body is essentially a very sensitive electromagnetic instrument, controlled by highly complex and orderly oscillatory electrical processes. Each one of these electro-biological processes vibrate at a specific frequency – some of which happen to be close to those used, for example, in modern GSM cell phone technology. The pulsating, low-intensity waves from mobile phones can exert subtle, non-thermal influences on your body. As mobile phones are widely used nowadays, the design of special shielding materials, reducing their negative interference, is rather actual.

The explosion of mobile phone use in the last few decades has been astounding: In 1990 there were approximately 1 million mobile phone subscribers in the world, by 2009 this had grown to 4,6 billion. By 2011 there were 6 billion mobile phone users. In order to provide the correct work of all these phones it's necessary at least 30 million base stations. Prof. Kenneth J. Rothman, one of the world's leading epidemiologists, states the following: "Within only a few years a substantial proportion of the world's population has adopted a new technology that involves placing a small radio transmitter up against the head, in some instances for hours a day"

Mobile phones transmit and receive radiofrequency signals in order to communicate. This signals from mobile phones fall within the microwave part of the electromagnetic spectrum. This radiation is also referred to as microwave radiation or electromagnetic radiation. Consequently, our landscapes and cities are covered by base stations that relay the microwave signals used for communication. Both the base stations and the mobile phones emit microwave radiation.

Prolonged and repeated exposure to aggressive electromagnetic field and related by it electromagnetic radiation causes a measurable stress response, a negative shift in energy in the human bio-field.

A study led by Dr Agarwal, Ph.D summarizes some of the researched health consequences of the microwave radiation users are exposed to though mobile phone use: "Electromagnetic waves alter electric activity of the brain and cause disturbance in sleep; cause difficulty in concentration, fatigue, and headache; and increase reaction time in a time-dependent manner. They increase the resting blood pressure and reduce the production of melatonin. They are also implicated in DNA strand breaks" In addition, the use of mobile phones has also been related to Alzheimer's Disease and Cancer.

A study by Swedish researchers suggests the link between mobile phone use and Alzheimer's Disease: "Mobile phones damage key brain cells and could trigger the early onset of Alzheimer's disease. Researchers have found that radiation from mobile phone handsets damages areas of the brain associated with learning, memory and movement." This study was performed on rats, which were exposed to radiation equivalent to that of a cell phone for only two hours. The brains were examined after 50 days, and the researchers found an abundance of dead brain cells in the exposed rats.

Various products are being marketed to increase the safety of mobile phone use. They generally take the form of earpiece pads/shields, antenna clips/caps, absorbing buttons and shielding cases. The Hi-tech Shield is one of such products. It is in the form of a chip to absorb the harmful excessive radiation, mainly produced by antenna, receiver, and microphone, and then to transform the radiation to heat so no harm shall be done to the body. Individually and collectively, these cutting-edge technologies offer a groundbreaking and effective way to deal with the cumulative stress associated with living in today's electronic environment. Another type is SAR Shield. SAR is Specific Absorption Rate.

SAR Shield was developed using the P.A.M. SYSTEM® technology widely used in aerospace findings. SAR Shield is based on the technology which is comparable to the electro-physical principles that make US Air force Stealth aircraft invisible to radar systems. The materials used in the construction of the SAR Shield withhold and dissipate electro-magnetic waves without reflecting them into the surrounding environment. SAR Shield can be fitted quickly and simply to all cellular phones using a self-adhesive backing. The SAR Shield is metallic blue and silver, to complement the design of the phone.

A separate type of the means for protection from negative mobile phones waves' impact is Radiation Free Headset. It gives the maximum protection from any harmful radiation reaching brain of users. In addition their hands stay free in the time of communication.

The main disadvantage of all listed means for human body protection from electromagnetic radiation of cellular phones is a low value of absorption area or its absence (as with Radiation Free Headset). Special phone cases for mobile phones are denied of this drawback. They are based on the module including double-layer water-containing material. There is a foil between these layers. The module is placed in a sealed enclosure. The thickness of whole structure is 5 mm.

The construction is inserted in the back part of a phone case, between body of user and cellular phone. It allows to block of electromagnetic wave propagating in the direction to user, while maintaining nearly constant directional pattern of a cellular phone and not contributing to the attenuation of the communication channel. The application of such protection device implies the use of a wired hands-free headset with a cellular phone during the conversation.

This special case allows to attenuate negative for human body electromagnetic radiation power from cellular phone into 500 times.