



Όρια έκθεσης EMF



Παραθέτονται Παρακάτω διεθνείς παραδοχές ορίων ΗΜΠ. Όρια Υψηλών Συχνοτήτων μονάδα μέτρησης $\mu\text{W}/\text{m}^2$ 600 to 3000 MHz

1





$\mu\text{W}/\text{m}^2$	Οργανισμός
1,000-100,000	In the vicinity of cell towers (up to 400 m)
2,000-20,000	Cordless phones (DECT/GHz technology) (1 m distance)
1,000-10,000	Wi-Fi router/access point/PC card (50 cm distance)
170	Seletun Consensus Statement (2010) Precautionary recommendation http://iemfa.org/index.php/publications/seletun-resolution
100	Working Group of EU STOA Panel (2001) Precautionary recommendation http://www.europarl.europa.eu/stoa/publications/studies/20000703_en.pdf BioInitiative Working Group (2007) Precautionary recommendation for indoor environment http://www.bioinitiative.org/report/index.htm BUND (Friends of the Earth Germany) (2008) Precautionary recommendation for hazard protection
10	Health Department of the Federal State of Salzburg (Austria 2002) BUND (Friends of the Earth Germany) (2008)
2	BioInitiative Working Group 2012
3-6	Building Biology Evaluation Guidelines (SBM-2008)
< 0.1	Minimum level required to maintain connection with cell phone handset
0.001	Natural background



Μετατροπή μονάδων μέτρησης $0.1 \text{ W}/\text{m}^2 = 100 \text{ mW}/\text{m}^2 = 100,000 \mu\text{W}/\text{m}^2 = 10 \mu\text{W}/\text{cm}^2$





Όρια Μαγνητικού Πεδίου από ρεύματα 50Hz Χαμ, Συχν. (B) σε nT ΝανοΤέσλα



σε nT	Οργανισμός
200	NCRP
300-400	WHO
200	TCO
<200	argeTQ
<100	ÖKOPASS
<100	BioInitiative Working Group
100-500	Ισχυρα
> 500	Πολύ ισχυρα
Τιμές πάνω από 250nT χρήζουν Θωράκισης	
< 0.0002	Natural background

Μετατροπή μονάδων μέτρησης

1nT (νανοΤεσλα)= 10-9 T (τέσλα)





Όρια Ένταση Ηλεκτρικού Πεδίου (Ε) Εναλλ. Ρεύματος (50Hz) (Β) σε V/m



σε V/m	Οργανισμός
4	
10	NCRP
10	WHO
10	TCO
<10	argeTQ
<10	ÖKOPASS
<10	BioInitiative Working Group
1,5-10	Ισχυρα
> 10	Πολύ ισχυρα
Τιμές πάνω από 10V/m χρήζουν Θωράκισης	
< 0.0001	Natural background

Μετατροπή μονάδων μέτρησης

1V/m Βόλτ ανα Μέτρο





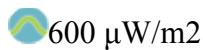
Effects by Power Density



Power Density	Reported Biological Effects	References: Primary/(Secondary)
0.00001 µW/m ²	Altered EEG in human subjects	Brise 1978 (Firstenberg, Bevington)
0.0001 µW/m ²	Effects on immune system in mice	Bundyuk 1994 (Firstenberg)
0.0002 µW/m ²	Stimulation of ovulation in chickens	Kondra 1970 (Firstenberg)
0.05 µW/m ²	Effect on cell growth in yeast	Grundler 1992 (Firstenberg)
0.1 µW/m ²	Conditioned “avoidance” reflex in rats	Kositsky 2001 (Firstenberg)
~7 µW/m ²	(0.05V/m) Adverse health effects around GSM 1800	Eger / Naila study (Bevington)
20 µW/m ²	Sleep disorders, abnormal blood pressure, nervousness, weakness, fatigue, limb pain, joint pain, digestive problems, fewer schoolchildren promoted—controlled study near a shortwave transmitter	Altpeter 1995, 1997 (Firstenberg)
20 to 7000 µW/m ²	Behavior disorders, increased health problems, and reduced milk yield in cows near TV and cell phone transmission antenna	Loscher W, Kas G 1998 (Lai)
100 µW/m ²	A study of medical complaints of people with long-term exposure in their	Oberfranken 2005

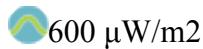


homes: Over 100 $\mu\text{W}/\text{m}^2$ only 5-6% of the sample (172 people) did not experience adverse health effects.



Altered EEG, disturbed carbohydrate metabolism, enlarged adrenals, altered adrenal hormone levels, structural changes in liver, spleen, testes, and brain—in white rats and rabbits

Dumanskij 1974 (Firstenberg)



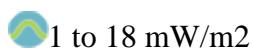
Slowing of the heart, change in EEG in rabbits Serkyuk, reported in McRee 1980 (Firstenberg)



6



(0.6V/m) X3 cancer rate at <400m from Eger (Naila study) 2004 a phone mast (Bevington)



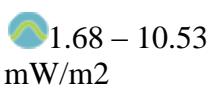
Decreased life span, impaired reproduction, structural and developmental abnormalities in duckweed plants

Magone 1996 (Firstenberg)



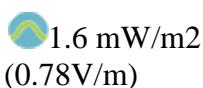
Decreased cell growth (human epithelial amnion cells)

Kwee 1997 (Firstenberg)



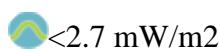
Irreversible infertility in mice after 5 generations of exposure to RFR from "antenna park"

Magras & Xenos, 1997 (Sage, Lai)



Skrunda radar (Latvia) affects children's memory, attention, motor function

Kolodynki, 1996 (Sage, Bevington)



(<1V/m) <350m phone mast: x4 cancer, Wolf & Wolf 2004 x10 female cancer

(Bevington)



<2.7 mW/m ²	(<1V/m) 3G phone mast: cognitive impairment, muscular pains, headaches, dizziness,	Zwamborn 2003 (Bevington)
~2.7mW/m ² to 6.0 mW/m ²	(~1.0-1.5 V/m) < 400m phone mast : x3 Navarro 2003, Oberfeld 2004, risk of cancer 10 years	Santini 2002 (Bevington)
2 - 80 mW/m ²	Two-fold increase in childhood leukemia / RFR exposure to AM/FM towers	Hocking, 1996 (Sage, Lai)
3-16.4 mW/m ²	Children exposed to 154 to 162 MHz had a reduction in memory/attention, motor function, and reflexes compared to controls	(Santini)
6 mW/m ²	Change in calcium ion efflux from brain tissue	Dutta 1986 (Firstenberg)
6 mW/m ²	Cardiac arrhythmias and sometimes cardiac arrest (frogs)	Frey 1968 (Firstenberg)
8 and 80 mW/m ²	Increased activity of alkaline phosphatase activity in guinea pigs (2375 MHz)	Pashovkina MS et al, 2000 (Lai)
10 mW/m ²	Whole body microwave irradiation of male mice caused a significant effect on the immune system	Fesenko, 1999 (Sage, Lai)
10 mW/m ²	Irradiation (5 hours) with low-power microwaves stimulates the immune potential of macrophages	Novoselova, 1999 (Sage, Lai)

7



10 mW/m ²	Headache, dizziness, irritability,	Simonenko 1998 (Firstenberg)
----------------------	------------------------------------	------------------------------





fatigue, weakn and T cells ess, insomnia, chest pain, difficulty breathing, indigestion (humans—occupational exposure)

- 10 mW/m² Stimulation of white cells in guinea pigs Shandala 1978 (Firstenberg)
- 10 – 24 mW/m² Chronic irradiation of American Embassy in Moscow of 600 MHz to 9.5 GHz resulted in increased risk of leukemia and uterine cancer (Santini)
- 13 - 57 mW/m² Two-fold increase in leukemia in adults Dolk, 1997 (Sage) from AM RF exposure
- 20 mW/m² “Microwave hearing”—clicking, buzzing, chirping, hissing, or high-pitched tones Frey 1963, 1969, 1971, 1973, 1988, Justeson 1979, Olsen 1980, Wieske 1963, Lin 1978 (Firstenberg)
- 25 mW/m² Breakdown of blood-brain barrier (used Salford 1997 (Firstenberg) a digital cellular phone to provide the radiation)
-
- 8 -40 mW/m² Altered white blood cell activity in schoolchildren Chiang 1989 (Firstenberg)
- ~20-40 mW/m² Direct effect of RFR on ion channels in D'Inzeo, 1988 (Sage) cells/opening of acetylcholine channels
- 40-100 mW/m² Visual reaction time in children is slowed//lower memory function in tests Chiang, 1989 (Sage)
- ~50 – 100 mW/m² (4.3-6.1V/m) x10 leukaemia, x6 NHL Szmigelski 1996 (Bevington)
- 50 mW/m² Exposure of pregnant rats to GSM-like 940 MHz radiation results in aberrant expression of bone morphogenetic proteins in the kidneys of newborn rats Pyrpasopoulou et al, 2004 (Panagopoulos-Margaritis)
- 50-1200 mW/m² Increased mortality of avian embryos Xenos and Magras, 2003 (Panagopoulos-Margaritis)





50 mW/m ² 50 - 100 mW/m ² 50 mW/m ² 66 mW/m ² <hr/> 100 mW/m ² 100 mW/m ² 100 mW/m ² (0.0027 W/Kg SAR) 100-200 mW/m ² 100 - 250 mW/m ² 200 mW/m ² 300 mW/m ² (0.015 W/Kg SAR)	<p>Biochemical and histological changes in liver, heart, kidney, and brain tissue</p> <p>Impaired nervous system activity</p> <p>Leukemia, skin melanoma and bladder cancer near TV and FM transmitter</p> <p>(5V/m) Decreased sperm count</p> <p>Decreased size of litter, increased number of stillborns in mice</p> <p>Redistribution of metals in the lungs, brain, heart, liver, kidney, muscles, spleen, bones, skin, blood</p> <p>Changes in active avoidance conditioned reflex (behavioral change) after 0.5 hour exposure</p> <p>Increase in micronuclei (abberant DNA form) found in workers chronically exposed to microwaves at 1250-1350 MHz.</p> <p>Changes in the hippocampus of the brain</p> <p>900 MHz pulsed with 217 Hz result in slight transient elevation in cortisol production</p> <p>Immune system effects - elevation of PFC count (antibody-producing cells)</p>	<p>Belokrinitkiy 1982 (Firstenberg)</p> <p>Dumansky, 1974 (Sage, Bevington)</p> <p>Dolk 1997 (Firstenberg)</p> <p>Adey 1982 (Bevington)</p> <p>Il'Chevich (reported in McRee 1980) (Firstenberg)</p> <p>Shutenko 1981 (Firstenberg)</p> <p>Navakatikian, 1994 (Sage)</p> <p>Garaj-Vrhovac, 1999 (Sage, Bevington)</p> <p>Belokrinitsky, 1982 (Sage)</p> <p>Mann, K et al 1998 (Lai)</p> <p>Veyret, 1991 (Sage)</p>
--	---	--



500 mW/m ²	An 18% reduction in REM sleep (important to memory and learning functions)	Mann, 1996 (Sage)
1000mW/m ²	Changes in immune system function	Elekes, 1996 (Sage)
1000 mW/m ² (0.027 W/Kg SAR)	A 24% drop in testosterone after 6 hours exposure	Navakatikian, 1994 (Sage)



10

Θωρακίζουμε κτηρια και ανιχνεύουμε Ηλετρομαγνητικά πεδια που βάλουν περιοχές, κτηρια και οικισμούς λόγω υπαρξης πάρκων κεραιών στην περιοχή

