

RADIOFREQUENCY / MICROWAVE EXPOSURE GUIDELINES

(High Frequency Electromagnetic Waves)

1> BUILDING BIOLOGY PRECAUTIONARY GUIDELINES (SBM-2015) For Sleeping Areas

Power density (Peak)	No Concern	Slight Concern	Severe Concern	Extreme Concern
microWatts per square meter $\mu\text{W}/\text{m}^2$	< 0.1	0.1 - 10	10 - 1000	> 1000
microWatts per square cm $\mu\text{W}/\text{cm}^2$	< 0.000,01	0.000,01 - 0.001	0.001 - 0.1	> 0.1
milliWatts per square meter mW/m^2	<0.000,1	0.000,1 - 0.01	0.01 - 1	> 1
Signal strength				
Volts per meter V/m	< 0.006,14	0.006,14 – 0.061,4	0.061,4 – 0.614	> 0.614

2> **BIOINITIATIVE REPORT PRECAUTIONARY GUIDELINES (Dec 31, 2012) Updated 2014-2020** www.bioinitiative.org
BioInitiative Working Group, Cindy Sage and David O. Carpenter, Editors. A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Radiation. Precautionary target level is **3 - 6 $\mu\text{W}/\text{m}^2$ or 0.000,3 – 0.000,6 $\mu\text{W}/\text{cm}^2$ (Peak)**

3> CANADA AND UNITED STATES GOVERNMENT GUIDELINES (1999, 2009, 2019)

In Canada, guidelines for Radio Frequency Wave exposure lay under the jurisdiction of Health Canada. Safety code 6 was developed in 1999 and offers federal guidelines for safe RF exposure levels. These limits are in the range of **2,000,000 to 10,000,000 $\mu\text{W}/\text{m}^2$ or 200 to 1000 $\mu\text{W}/\text{cm}^2$ (Time Averaged)** and are based solely on the short term thermal effects or the heating of body tissue. Adverse biological effects have been documented at levels far below Safety Code 6 guidelines. No Canadian biological exposure guidelines exist for long term exposure to low level Radio Frequency Radiation. This also holds true for the USA and their FCC guidelines.

AC MAGNETIC & AC ELECTRIC FIELD EXPOSURE GUIDELINES

(Low Frequency Electromagnetic Fields ELF, VLF)

1> BUILDING BIOLOGY EVALUATION GUIDELINES (SBM-2015) For Sleeping Areas

AC Magnetic - Flux Density	No Concern	Slight Concern	Severe Concern	Extreme Concern
in nanotesla nT	< 20	20-100	100 - 500	> 500
in milligauss mG	< 0.2	0.2-1	1-5	> 5

AC Electric Field strength with ground potential in volt per meter V/m TRMS	< 1	1-5	5 - 50	> 50
Body voltage with ground potential in millivolt mV	< 10	10-100	100 - 1000	> 1000
Field strength potential-free in volt per meter V/m TRMS	< 0.3	0.3-1.5	1.5 - 10	> 10

2> **BIOINITIATIVE REPORT PRECAUTIONARY GUIDELINES (Aug 31, 2007)** www.bioinitiative.org
BioInitiative Working Group, Cindy Sage and David O. Carpenter, Editors. A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Radiation. Precautionary target level for AC Magnetic Fields **1-2 mG / 100-200 nT**. Precautionary target level for AC Electric Field levels are not addressed in the report.

3> CANADA AND USA GOVERNMENT GUIDELINES (1999)

In Canada, guidelines for EMF exposure lay under the jurisdiction of Health Canada. Health Canada has not independently established guidelines for magnetic field or electric field exposure. When pressed, they will state that Canada follows the International Commission on Non-Ionizing Radiation Protection "ICNIRP" guidelines (1998) of 830 mG or 83,000 nT at 60 Hz (Magnetic Field) or 4167 V/m (Electric Field) at 60 Hz for a 24-hr period. Since these guidelines are based on short-term acute exposure we still do not have guidelines that protect the public from long-term low level exposure, which is the case with the distribution of electricity. Associations based on epidemiological studies and cause-effect relationships based on laboratory experiments suggests that exposure to magnetic and electric fields should be thousands of times lower.