Questions and Answers about the Standard of Building Biology Testing Methods and the Building Biology Evaluation Guidelines for Sleeping Areas

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How did it start? How did the Standard of Building Biology Testing Methods evolve?

Twenty-five years ago, we from Baubiologie Maes began structuring the various aspects pertaining to the *Building Biology Testing Methods*. Based on our testing experience, we developed the *Standard* in cooperation with and on behalf of the Institute of Building Biology + Ecology Neubeuern (IBN) in the following years. Scientists, experts, medical doctors and colleagues offered their support. Soon thereafter the *Building Biology Evaluation Guidelines for Sleeping Areas* were developed. Both the *Standard* including the *Evaluation Guidelines* were first published in 1992.

The current version is called SBM-2008, which is the 7th edition and will be published at the beginning of 2008. Since 1999 the *Standard of Building Biology Testing Methods* as well as the *Evaluation Guidelines,* including any relevant considerations and amendments, continue to be created and issued by a 10-member expert commission.

Who is using the Standard today?

Today the *Standard of Building Biology Testing Methods* is used as a guide for professional and independent testing of homes worldwide, including Europe, the US, Canada, Australia or New Zealand. Building biology consultants, associations, institutes, laboratories and manufacturers of testing equipment base their recommendations on it. Affected people, medical doctors, clinical ecologists, consumer associations and citizen groups are grateful for its guidance. Politicians, authorities, industry and courts take note of it as an addition and also as a provocative alternative to established science. The *Standard* and *Evaluation Guidelines* are the basis for many continuing education courses and expert seminars as well as publications and books.

What makes the Standard so unique?

The *Standard of Building Biology Testing Methods* with its three major categories A, B and C and a total of 18 subcategories offers a holistic approach. For the first time, this *Standard* covers all homemade physical, chemical, microbiological and indoor air quality risk factors, ranging from electromagnetic pollution, radioactivity, geological disturbances and noise to indoor toxins and indoor climate, including particulates, mold and allergens. Nothing is overlooked. Still the world's first and so far unparalleled in their scope, the *Evaluation Guidelines* that accompany the *Standard* focus on the sensitive and essential sleep phase and resting period, which is associated with long-term exposures.

What goals or philosophy does the Standard pursue?

It is our goal to identify, localize and assess sources of potential exposures through a holistic check of all subcategories of the *Standard of Building Biology Testing Methods* as well as a smart combination of the numerous diagnostic tools in order to help create indoor living environments that are as exposure-free, low-risk and natural as possible. Building biology surveys are conducted directly on site, for example, in bedrooms, living spaces, at workplaces or on properties; we use science-based testing equipment or laboratory analysis to document and assess. For any elevated readings, respective remediation recommendations are developed. The professional identification and minimization of such risk factors within an individual's framework of achievability; this is what *Building Biology Testing Methods* are all about.

The *Building Biology Evaluation Guidelines* offer optimal preventive health care and this – as

mentioned above - for the especially crucial and vulnerable long-term exposure period at night when regeneration is meant to occur. The *Evaluation Guidelines* as well as the entire *Standard* follow the achievable and are the result of thousands of documented real-life surveys and patients' own accounts. Our guiding principle: Try to always reduce risks, you cannot go wrong with that.

What is the purpose of the Evaluation Guidelines?

First of all, they are meant to provide proper preventive health care. This applies especially to persons who are in need of protection such as children, the elderly, sensitive persons, chronically ill persons, those with impaired immunity, cancer patients, etc. The *Evaluation Guidelines,* of course, are also meant for healthy people who wish to keep their personal exposure to environmental risk factors as low as possible.

How were the Evaluation Guidelines developed and what are they based on?

First of all – as indicated above – they are based on experience. We observed how people, especially ill people, respond when stress factors they have been regularly exposed to, especially in sleeping areas, for a long time, sometimes even years, are removed, remediated. Frequently, the surprise was huge because with the removal or drastic reduction of electromagnetic pollution, indoor toxins or mold, people started to heal or got at least better.

This would inspire us to pay further attention and to experiment. The moment we had gathered a large number of conclusive and unambiguous case histories, we dared suggest the first *Building Biology Evaluation Guidelines*. Children are ideal cases not only because they are in need of protection, but also because they show a low tendency towards placebo effects and therefore are great indicators.

In consultation with the *Standard Commission* as well as medical doctors and colleagues, the *Evaluation Guidelines* are continually adjusted to new emerging knowledge. We are in constant communication with each other. Many of the recommended reference values remained the same over all the years, they have proven themselves, and some were corrected. If sufficient experience in the building biology community is missing, e.g. asbestos, we adopt other useful recommendations and studies.

Even with all the reference values, we focus on feasible reductions and, if there is the slightest shred of doubt, we consider nature the ultimate guide.

Is it scientifically comprehensible?

From an empirical scientific point of view: yes. From a strictly orthodox scientific point of view: less so. The orthodox scientific method often uses a different approach: Healthy people are subjected to mostly short-term exposures, and their reactions are observed under laboratory conditions. Real life is not laboratory, short-term is not long-term, wake period is not sleep phase, adults are not children, ill persons are not healthy persons, etc.

What we have done and are still doing is quite marvelous: We minimize long-term exposures and pay attention to what happens in real life, in the living environment, especially sleeping areas, where people actually live and sleep.

Why are Building Biology Reference Values so low?

Low is relative. What is used as a benchmark? Counterquestion: Why do official authorities suggest such high exposure limits? Only in comparison with these astronomically and irresponsibly high official and legally binding exposure limits do our *Building Biology Reference Values* appear to be so low, but in actual fact they are not that low, at least not exaggeratingly so. *Building Biology Reference Values* are not low at all costs. We demand that they can be realized in 95% of all cases.

Examples?

Let's have a closer look at ELF magnetic fields: With regard to health problems, the TCO Standard for low-emission computer monitors demands 200 nT at a workplace, international studies warn of problems with Alzheimer's over brain tumors to cancer from 200 nT. And after reviewing scientific studies from around the world, the WHO declares 300 to 400 nT as a "potential cancer risk for humans." In this context, building biology recommendations are certainly reasonable, at least from a preventive health care point of view: 20 nT is considered ideal, up to 100 nT as a slight concern, up to 500 nT as a strong concern and anything above as an extreme concern. The official, legally binding exposure limit is
100,000 nT (1,000 mG), whether there is research and WHO or not.

This is what I mean by irresponsible: Orthodox science tells us that 300 nT represents a cancer risk and 100,000 nT are allowed, 333 times more.

Let's have a closer look at ELF electric fields. Studies show that long-term exposures at 10 V/m increase the risk for childhood leukemia, cancer and other health problems. The low-emission computer monitor standard demands 10 V/m. We find this kind of field strength in every third bed and not only there. Building biology recommends 1 V/m and considers up to 5 V/m as a slight concern, up to 50 V/m as a strong concern and anything above as an extreme concern. Legislators expect humans to tolerate 5,000 V/m.

What happens during radiofrequency radiation (RF) exposure?

10 million microwatts per square meter are allowed, unbelievable. Many times over, it was scientifically demonstrated that at a fraction of this RF radiation level the blood-brain barrier opens, EEG patterns change, tumors increase, cellular defects occur, nerves are damaged, blood cells clump together, the immune system goes out of whack, etc. During long-term exposures, people start reacting with subjective symptoms, a myriad of diffuse health problems, feelings of discomfort, dizziness, a lack of concentration, buzzing in one's ears, sleeplessness, etc. - and that at a fraction of this fraction of RF radiation.

Since the scientific assessment, which forms the basis for exposure limits, limits itself to thermal effects when actual heat is generated and so far no other effect mechanism is known or acknowledged by everyone, they jump to the conclusion: If there is no heating of the body, there is no risk. Building biology does not play along this wavelength; after all humans are not sausages in a microwave oven. Building biology recommendations intend to protect from non-thermal effects, from sleep problems and headaches over nerve irritations and tinnititus to immune system and cell damages, and that is not mentioning quality of life. During sleep, 0.1 $\mu W/m^2$ is considered ideal, up to 10 $\mu W/m^2$ as a slight concern, up to 1,000 $\mu W/m^2$ as a strong concern and anything above as an extreme concern.

By now, we have a myriad of many different wireless technologies and modulation types; we have hundreds of them. And all the time new ones are added without any fundamental research … Due to the speed of the new developments, there cannot be sufficient experience, a precautionary approach should be chosen, reference values can only serve as a guide. In this case it is therefore especially important to follow the motto: as little as possible!

What about the pulse modulations that were introduced with various wireless technologies?

Certainly, we should pay particular attention, precaution and caution to the pulse modulated or periodic wireless signals (e.g. mobile phones, DECT cordless phones) and even more so to those pulses within the extremely low frequency range where our brain waves are active (e.g. WLAN). In my opinion, the latter should be even more critically assessed. First reported health complaints indicate trouble. Over time, experience will tell us more.

Furthermore, there is not just an increasing number of case histories, but scientific investigations also indicate that some other newly applied modulations, which do not fit the clean stroboscopic-type on/off pulse pattern anymore, are associated with considerable biological risk.

Some of the new wireless technologies seem to be even more biologically active than the previous pulse modulations, I am thinking especially of the very broadband UMTS signals. Those and other broadband technologies including the pulse modulations are going to become even more widespread, indoors and outdoors. The industry is happy. Humans will be the guinea pigs.

Effects, interactions?

What do we know about individual effects? Rather little. And about the interactions between various factors? Even less. This is true not just for radiofrequency radiation but for all other subcategories of the *Standard* as well. In mathematics, one plus one equals two. In biology, it can equal 10, 20 or 50. Mobile phone radiation plus wood preservatives plus flickering compact fluorescent lamps plus mold plus amalgam fillings amount to a sum of incalculable problems.

Building biology stands for special protection?

As long as political, official, scientific and industrial standards for the assessment of biological effects caused by radiation exposure consider thermal effects only, as long as exposure limits for ELF magnetic fields remain at 100,000 nT, even though the WHO at its highest level has recognized 300 to 400 nT as a cancer risk, as long as pesticides are still allowed in children's rooms, as long as we have no legally binding criteria for mold and bacterial exposures, as long as asbestos is still mined and installed even though it already cost millions of lives, as long as new inventions, e.g. wireless technologies, chemicals and nanotechnology, are let loose upon an uninformed humanity and an overwhelmed nature without any fundamental research, it is essential that we watch out, that we have *Building Biology Evaluation Guidelines* for the real protection of human health. If you want real protection, you can forget about scientific standards and official exposure limits.

After 25 years of development, building biology offers with its *Evaluation Guidelines* honest and reasonable guidance for human protection from risks, for preventive health care, probably the most honest recommendations that can be found in this world of exposure limits.

Science?

Science is a yes when it serves humanity, nature, life. Science is a no when only biased interests are served, and this happens frequently: industrial, political, financial interests, when economic growth is more important than public health.

Is building biology science?

Building biology is science because it creates knowledge, practical to apply, practical to use knowledge, because building biology pursues research, finds facts, informs, and uncovers the truth. *Building Biology Testing Methods* are objective, transparent, reproducible, science-based. Knowledge forms the basis for change, improvement.

All activities within the framework of *Building Biology Testing Methods* are based on human needs, not the industry, not politics, not exposure limits or regulations, not the public health office, not research that got lost in too much theory and tangled in dubious ties. We building biology professionals are independent and do not care about science when science looses sight of humans, when incalculable risks are generously accepted, when it turns into a wish foundation for an insatiable industry. Building biology is an essential addition to science, blazing a trail for research. Building biology blows life, especially with practical relevance, into orthodox science.

Sometimes gathering proof takes its time, for building biology it feels more urgent ...

Building biology takes action, helps contain damage and that at the first serious signs and before final conclusive scientific evidence is provided, which can take a long, too long time until it is too late. In the case of asbestos, it took 100 years from the knowledge about a cancer risk until the first acceptable exposure limits were issued and finally it was banned. In the case of

radioactivity, PCB, PCP, DDT and other harmful environmental factors, it also took years, too many years with many, too many people suffering. Building biology is a necessary addition, a pioneering research. Building biology introduces true practice, real life to orthodox science.

Building biology reduces risks and does not keep problems under wraps, but brings up the painful subjects and offers healing, in a pragmatic, holistic, responsible and independent fashion.