Dear Contributor,

Thank you for participating in the public consultation of the ICNIRP draft guidelines.

Please note that it is important that ICNIRP understands exactly the points that you are making. To facilitate our task and avoid misunderstandings, please:

* be concise
* be precise
* provide supporting evidence (reference to publication, etc.) if available and helpful.

**How to complete the comments table:**

Please use 1 row per comment. If required, please add extra rows to the table.

This response document asks you to provide your ‘comment’, your ‘proposed change’, and the ‘context’ to this comment and proposed change. What is meant by these is the following:

**Comment :** A brief statement describing the issue that you have identified (and that you would like ICNIRP to take into account in the final version of the guidelines).

**Proposed Change:** A brief statement describing how you would like the document changed to account for this issue.

**Context:** A brief statement identifying relevant documents in support of your comment and proposed change.

**Please, provide your details below as per the online form and the provision of the privacy policy**

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| --- | --- | --- |
| Last name, first name: Enders, Prof. Dr. Achim | Email address: Your email address. | Affiliation (if relevant): Institute for Electromagnetic Compatibility, Technical University Braunschweig, Schleinitzstr. 23, 38106 Braunschweig Germany |
| If you are providing these comments officially **on behalf** of an organization/company, please name this here: organization/company | | |
| X I hereby agree that, for the purpose of transparency, **my identity (last and first names, affiliation and organization where relevant) will be displayed** on the ICNIRP website after the consultation phase along with my comments.  ☐ I want my comments to be displayed anonymously. | | |

|  | **Document**  **(Guidelines, App A,**  **App B)** | **Line Number**  **#** | **Type of comment (General/ Technical/ Editorial)** | **Comment. Proposed change. Context.** |
| --- | --- | --- | --- | --- |
| **1** | Appendix A | Line number | General | The use of the large letter H in the quantities Hinc and Htr should be changed to a non-preoccupied one. The established and simultaneously also here used meaning of H is magnetic field strength with unit A/m. It is confusing to now have H with indices Hinc and Htr with a physically different meaning and unit than that for the also used quantities H and H\*. This comment applies for the guidelines and all other text as well.  Use e.g. the small letter w instead.  Explain the context of your comment. |
| **2** | Appendix A | Chapter 2.2 and 2.3 | General | All new notions comprising the last word “density” should be defined more precisely as being “flow densities”. This is obvious for the wording “power density” for the Poynting vector in line 84, which is physically a “power flow density” with unit W/m2 and not W/m3. While this in itself might be regarded as well-known, i.e. pedantic, the newly established notions “transmitted power density”, “transmitted energy density” as well as their occurence in the guidelines in Table 1, and “incident power density” and “incident energy density” could be misinterpreted as having dimensional units per m3 and not m2 , the same in Table 1 of guidelines for the notion “equivalent incident power density” and at all other places of occurence.  Insert your proposed change.  Explain the context of your comment. |
| **3** | Appendix A | Chapter 2.2 and 2.3 | General | The given Eqn. 2.9 to 2.15 are only consistent, if the ideal situation is regarded, that the power flow density which is transmitted through the body surface is completely absorbed within the body. This is not generally valid, because there are variations in dielectric tissue parameters during propagation in the tissues/bones which give rise to reflections also within the body and also on the length scales (or even smaller) than the penetration depths. These internally reflected parts can reversally leave the body surface and then are at least partly not absorbed, so that Eqn. 2.9 could yield a different Str value than Eqn 2.10. Furthermore Eqn.2.10 is ill-defined insofar that the values of E and H are unclear: are they the values of the forward propagating field, of the mentioned backward propagating field due to body-internal reflection or the vector sum of both? The 1-dimensional treatment (i.e. perpendicular incidence of plane wave on multiple plane boundaries one after the other) gives an analytic description of this situation in the framework of transmission line theory. There the incident field at the first boundary is defined as the sum of the incoming and reflected field which again is the foundation for the derivation of the Eqn. 2.14. But my suggestion is to check whether such an analysis is needed here or whether the sole specification of Eqn. 2.9 suffices, because it denotes the worst-case (absorption of all). If any internal reflection gives a contribution to the re-emission the situation can only improve.  Insert your proposed change.  Explain the context of your comment. |
| **4** | Appendix A | 370 | Technical | Must be 2.15 cm and not 2.15 mm  Insert your proposed change.  Explain the context of your comment. |
| **5** | Guidelines | 103-105 | General | The wording „precautionary measures“ should be explained: Is it just for considering the accuracy of the given analysis or is it also for the consideration of the ALARA principle or even “unknown unknowns” – the latter two having a much larger impact on public discussions on EMF.  Insert your proposed change.  Explain the context of your comment. |
| **6** | Guidelines | 128-129 | General | The combination of „strong“ with “brief” for “enough” is not logical because “strong” and “long” will also be enough – is it meant in the sense “…if the induced field is short, but strong enough” ? Furthermore the field itself will not stimulate nerves, but the field will change the natural, physiological ion concentration profile in the nerves which will in turn make the stimulation.  Please correct “dielectric” before ”breakdown”.  Insert your proposed change.  Explain the context of your comment. |
| 7 | Guidelines | 156, table 1 | General | See above 2 and 3 for the notions. In the third last line a unit is named “radiant exposure”, please use “radiation exposure” instead  Insert your proposed change. |

Add further rows if needed. For this copy the above row.

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| **8** | Guidelines | 169,201 | Technical | The word “permeabilization” resembles the electromagnetic term for “permeability” as another word for “dielectric function” – is there another expression to avoid confusion?  Insert your proposed change.  Explain the context of your comment. |
| **9** | Guidelines | 375-379 | General | The logic of the arguing should be explicitly explained (again) because for its own a Type-2 is more sensitive than a Type-1 tissue.  Insert your proposed change.  Explain the context of your comment. |