IEC 62127-1
(First edition – 2007)

Ultrasonics – Hydrophones – Part 1: Measurement and characterization of medical ultrasonic fields up to 40 MHz

CORRIGENDUM 1

Page 9

3 Terms, definitions and symbols

3.37
near field

On page 17, instead of:

NOTE For circular planar transducers, this is at a distance less than $A_1/\pi\lambda$, where A_1 is the output beam area group and λ is the wavelength of the ultrasound corresponding to the **acoustic frequency**.

read:

NOTE For circular planar transducers, this is at a distance less than $A_{ob}/\pi\lambda$, where A_{ob} is the **output beam area** and λ is the wavelength of the ultrasound corresponding to the **acoustic frequency**.

3.38
non-linear propagation parameter

Instead of:

$$\sigma_m = \frac{\omega\beta l_1}{\rho c^3} p_m \frac{\ln\left(\left(F_g - 1\right)^{1/2} + F_g\right)^{1/2}}{\left(F_g - 1\right)^{1/2}}$$

read:

$$\sigma_m = \frac{\omega\beta l_1}{\rho c^3} p_m \frac{\ln\left(\left(F_g - 1\right)^{1/2} + F_g^{1/2}\right)}{\left(F_g - 1\right)^{1/2}}$$

3.44
peak-rarefactional acoustic pressure

On page 19, instead of:

p **(or** p_r**)**

read:

p_- **(or** p_r**)**

3.76
ultrasonic transducer element group dimensions

On page 24, delete Notes 2 and 3.

Page 24

4 List of symbols

Instead of:

F_g	0,69* A_g/(–6 dB beam area)
$v(f)$	instantaneous particle velocity
σm	non-linear propagation parameter

read:

F_g	0,69 · A_g/(–6 dB beam area)
v	instantaneous particle velocity
σ_m	non-linear propagation parameter

Page 28

5.1.7 Bandwith

5.1.7.1 Narrow-band approximation

Instead of:

where $M_{L,dB}(f) = 20\log\frac{M_L(f)}{M_0}$

read:

where $M_{L,dB}(f) = 20\log_{10}\frac{M_L(f)}{M_0}$ dB

5.1.8 Linearity

Instead of:

"The upper limit of known linear dynamic range shall be stated…"

read:

"The upper limit of known dynamic range shall be stated…"

Page 30

5.2.2 Positioning systems

5.2.2.2 Hydrophone positioning

Instead of:

" …so that the normal to the direction of maximum sensitivity…"

read:

"…such that the direction of maximum sensitivity…"

Page 32

5.4 Recommendations for ultrasonic equipment being characterized

Number the notes as Note 1 and Note 2.

Page 35

7.2 Primary pressure parameters

7.2.3 Spatial-peak rms acoustic pressure

Instead of:

NOTE 1 Particular regions of interest are those areas where on the beam axis maxima or minima of any of these pressures occur.

read:

NOTE 1 Particular regions of interest are those areas where on the beam axis maxima or minima of this pressure occur.

7.2.6 Intensity parameters using pulse-pressure-squared integral

7.2.6.1 Pulse duration

On page 38, instead of:

$$\frac{1}{M^2}\int_{t_1=0}^{t_a} V^2(t)\,dt = 0{,}1\ ppsi \quad \text{and} \tag{12}$$

$$\frac{1}{M^2}\int_{t_1=0}^{t_b} V^2(t)\,dt = 0{,}9\ ppsi \tag{13}$$

read:

$$\frac{1}{M^2}\int_{t_1=0}^{t_a} U^2(t)\,dt = 0{,}1\ ppsi \quad \text{and} \tag{12}$$

$$\frac{1}{M^2}\int_{t_1=0}^{t_b} U^2(t)\,dt = 0{,}9\ ppsi \tag{13}$$

Instead of:

V(t) is the measured output voltage of the **hydrophone**.

read:

U(t) is the measured output voltage of the **hydrophone**.

7.2.6.2 Spatial-peak pulse-average intensity

Instead of:

"…the acoustic impedance of distilled water…"

read:

"…the characteristic acoustic impedance of distilled water…"

7.2.6.3 Spatial-peak temporal-average intensity

In the first paragraph, instead of:

"For the non-auto-scanning mode…"

read:

"For the non-scanning mode…"

In the second paragraph, instead of:

"For an auto-scanning beam (e.g. automatic B-mode)…"

read:

"For a scanning mode (e.g. automatic B-mode)…"

In the final paragraph containing Equation 18, instead of:

"…for the non-auto-scanning mode…"

read:

"…for the non-scanning mode…"

and instead of:

"*srr* is the maximum **scan repetition rate** of the auto-scanning mode."

read:

"*srr* is the maximum **scan repetition rate** of the scanning mode."

7.2.7 Derived ultrasonic power

On page 39, in the note, instead of:

"…where the physical dimensions of the ultrasound transducer does not allow…"

read:

"…where the physical dimensions of the ultrasound transducer do not allow…"

Page 43

9 Compliance statement

9.2 Maximum probable values

In Note 2, on page 44, replace "IEC 6xxxx" *by* "IEC 62127-1" in four places.

Page 47

Annex B Hydrophones and positioning

B.9 Types of hydrophones

B.9.2 PVDF needle hydrophones

On page 50, in the last sentence of the subclause, instead of:

"The effective diameter of such probes…"

read:

"The effective diameter of such hydrophones…"

B.9.4 Fibre optic hydrophones

On page 51, in the text of item a), instead of:

"…according to the Fresnel intensity reflection coefficient, $R = [(n_c - n_w)/n_c + n_w)]^2$…"

read:

"…according to the Fresnel intensity reflection coefficient, $R = [(n_c - n_w)/(n_c + n_w)]^2$…"

Page 53

Annex C Acoustic pressure and intensity

Table C.1 Properties of distilled or de-ionized water as a function of temperature

On page 54, in the heading of the fourth column of Table C.1, instead of:

"**Acoustic impedance**"

read:

"**Characteristic acoustic impedance**"