

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:

$$\sigma_m = \frac{\omega\beta I_1}{\rho c^3} p_m \frac{\ln((F_g - 1)^{1/2} + F_g)^{1/2}}{(F_g - 1)^{1/2}}$$

read:

$$\sigma_m = \frac{\omega\beta I_1}{\rho c^3} p_m \frac{\ln((F_g - 1)^{1/2} + F_g^{1/2})}{(F_g - 1)^{1/2}}$$

3.44
peak-rarefactional acoustic pressure

On page 19, instead of:

p (or p_r)

read:

$p_{\bullet}$ (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	$0,69 \cdot A_g / (-6 \text{ dB beam area})$
$v(f)$	instantaneous particle velocity
σ_m	non-linear propagation parameter

read:

F_g	$0,69 \cdot A_g / (-6 \text{ dB beam area})$
v	instantaneous particle velocity
σ_m	non-linear propagation parameter

Page 28

5.1.7 Bandwidth

5.1.7.1 Narrow-band approximation

Instead of:

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

read:

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

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...”

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...”

5.4 Recommendations for ultrasonic equipment being characterized

Number the notes as Note 1 and Note 2.

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:

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

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

read:

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

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