

ULTRASOUND CERTIFICATION EXAM REFERENCE MATERIAL

Velocity v , wavelength λ and frequency f

$$v = \lambda f \quad \lambda = \frac{v}{f} \quad f = \frac{v}{\lambda}$$

Reflection at a boundary

$$R = \left\{ \frac{z_1 - z_2}{z_1 + z_2} \right\}^2$$

Transmission is 1-Reflection

Decibel from voltage

$$\text{dB}\mu\text{V} = 20 \log_{10}(\mu\text{V})$$

Voltage from decibel

$$\mu\text{V} = 10^{(\text{dB}/20)}$$

Attenuation change between two distances d_0 and d_1
in $\text{dB}\mu\text{V} = 20 \log_{10}(d_1/d_0)$

Look-up table of dB to factor conversions:

Db value	factor of
2	1.3
4	1.6
6	2.0
8	2.5
10	3.2
12	4.0
14	5.0
16	6.3
18	7.9
20	10.0
22	12.6
24	15.8
26	20.0
28	25.1
30	31.6
32	39.8
34	50.1
36	63.1
38	79.4
40	100.0
42	125.9
44	158.5
46	199.5
48	251.2
50	316.2
52	398.1
54	501.2
56	631.0
58	794.3
60	1000.0