Absorption Constant and what it means

Calculating the Absorption Constant

$$k_{ab\,(f)} = \frac{\left(\left(\frac{As_{(f)}}{Ps}\right)-\left(\frac{Am_{(f)}}{Pm}\right)\right)}{\left(\left(\frac{Ss}{Ps}\right)-\left(\frac{Sm}{Pm}\right)\right)}$$

Where:

k_{ab} = absorption constant

A_s = absorption of scattered sample, m² or Sabins

A_m = absorption of mono sample, m² or Sabins

S_s = area of scattered sample, ft² or m²

S_m = area of mono sample, ft² or m²

P_s = perimeter of scattered sample, ft or m

P_m = perimeter of mono sample, ft or m

(f) = frequency of interest in prediction

Formula for using the Absorption Constant

$$A_{x\,(f)} = k_{ab\,(f)} * S_x + \left(\left(\frac{A_{x\,(f)}}{P_m}\right) - k_{ab\,(f)} * \frac{S_m}{P_m}\right) * P_x$$

Where:

k_{ab} = absorption constant

A_x = absorption of surface being predicted, m² or Sabins

A_s = absorption of scattered sample, m² or Sabins

S_x = area of surface being predicted, ft or m

S_m = area of mono sample, ft² or m²

P_x = perimeter of surface being predicted, ft or m

P_s = perimeter of scattered sample, ft or m

P_2 = perimeter of mono sample, ft or m

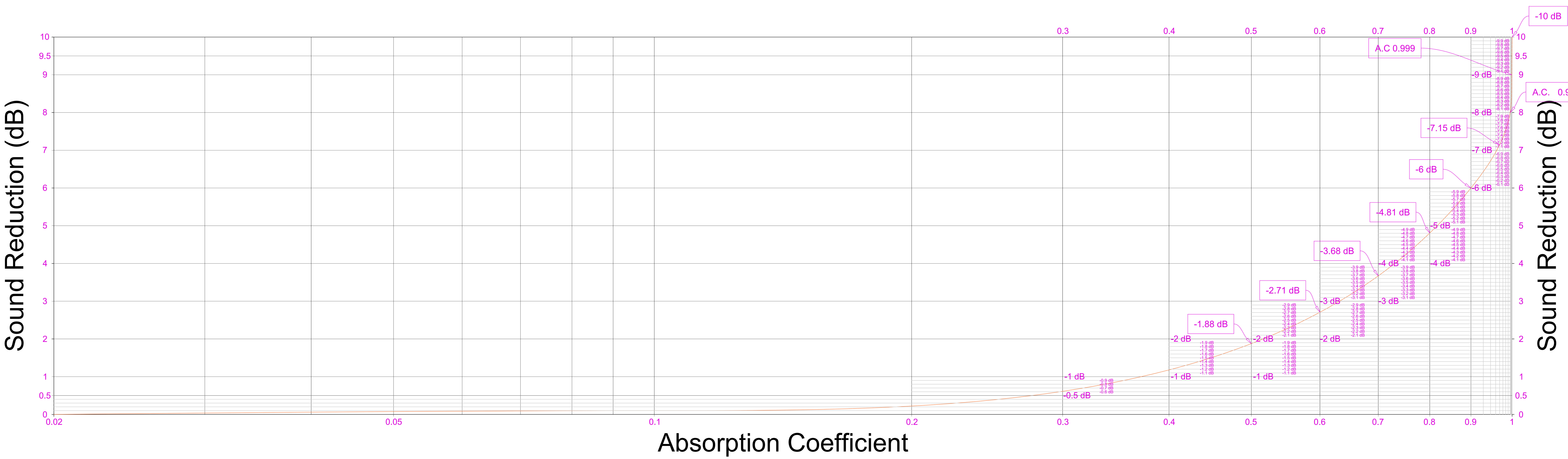
(f) = frequency of interest in prediction

The following is presented as educational. This is based on the latest research in the field of acoustics.

A common misunderstand of absorption coefficients is that they are a percentage. This is false. It was never devised as a percentage but rather a multiplier in a formula; coefficient - a numerical or constant quantity placed before and multiplying the variable in an algebraic expression.

The absorption coefficient of 1.0 equals the attenuation of 10 dB at the frequency tested. For example:

0.999 = -9 dB
0.99 = -8 dB
0.9 = -6 dB
0.8 = -4.81 dB
0.7 = -3.68 dB
0.6 = -2.71 dB
0.5 = -1.88 dB
0.4 = -1.18 dB
0.3 = -0.61 dB
0.2 = -0.21 dB
0.1 = -0.1 dB



Recording Studio, Performance Hall, & Architectural Acoustics Consultants

JH BRANDT

Summarecon Bekasi, Cluster Lotus, IA 20
Bekasi, West Java, Indonesia
email: john@jhbrandt.net
tel: +62 21 295 734 88 / +62 821 7777 1978
web site: http://www.jhbrandt.net

Drafter : John H. Brandt	Date : 03/27/2022
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