The difference in actual sound pressure for an increase of 10, 20 and 30 dB(A)

November 9, 2021

Sound Pressure for 65 dB(A)

dB(A) = 20 * log[sound pressure/sound pressure at 0 dB(A)]
65 dB(A) = 20*log[sound pressure/20]
65/20 = log[sound pressure/20]
3.25 = log[sound pressure/20]

$10^{3.25}$ = sound pressure/20

1778.279*20 = sound pressure = **35566 micro pascals at 65 dB(A)**

Sound Pressure for 75 dB(A)

dB(A) = 20 * log[sound pressure/sound pressure at 0 dB(A)]
75 dB(A) = 20*log[sound pressure/20]
75/20 = log[sound pressure/20]
3.75 = log[sound pressure/20]

$10^{3.75}$ = sound pressure/20

5623.413*20 = sound pressure = **112468 micro pascals at 75 dB(A)**

Sound Pressure for 85 dB(A)

dB(A) = 20 * log[sound pressure/sound pressure at 0 dB(A)]
85 dB(A) = 20*log[sound pressure/20]
85/20 = log[sound pressure/20]
4.25 = log[sound pressure/20]

$10^{4.25}$ = sound pressure/20

17782.794*20 = sound pressure = **355655.88 micro pascals at 85 dB(A)**

Sound Pressure for 95 dB(A)

dB(A) = 20 * log[sound pressure/sound pressure at 0 dB(A)]
95 dB(A) = 20*log[sound pressure/20]
95/20 = log[sound pressure/20]
4.75 = log[sound pressure/20]

$10^{4.75}$ = sound pressure/20

56234.133*20 = sound pressure = **1124682.66 micro pascals at 95 dB(A)**

% increase$_{65 - 75}$ = (112468/35566) * 100 = 316% increase or approx 3.2 times
% increase$_{65 - 85}$ = (355655.88/35566) * 100 = 1000% increase or approx 10 times
% increase$_{65 - 95}$ = (1124682/35566) * 100 = 3,162% increase or approx 31.6 times