

**The difference in actual sound pressure
for an increase or decrease of 10 and 12 dB(A)**

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Sound Pressure for 65 dB(A)

$$\begin{aligned} \text{dB(A)} &= 20 * \log[\text{sound pressure}/\text{sound pressure at 0 dB(A)}] \\ 65 \text{ dB(A)} &= 20 * \log[\text{sound pressure}/20] \\ 65/20 &= \log[\text{sound pressure}/20] \\ 3.25 &= \log[\text{sound pressure}/20] \\ 10^{3.25} &= \text{sound pressure}/20 \\ 1778.279 * 20 &= \text{sound pressure} = \mathbf{35566 \text{ micro pascals at 65 dB(A)}} \end{aligned}$$

Sound Pressure for 75 dB(A)

$$\begin{aligned} \text{dB(A)} &= 20 * \log[\text{sound pressure}/\text{sound pressure at 0 dB(A)}] \\ 75 \text{ dB(A)} &= 20 * \log[\text{sound pressure}/20] \\ 75/20 &= \log[\text{sound pressure}/20] \\ 3.75 &= \log[\text{sound pressure}/20] \\ 10^{3.75} &= \text{sound pressure}/20 \\ 5623.413 * 20 &= \text{sound pressure} = \mathbf{112468 \text{ micro pascals at 75 dB(A)}} \end{aligned}$$

Sound Pressure for 77 dB(A)

$$\begin{aligned} \text{dB(A)} &= 20 * \log[\text{sound pressure}/\text{sound pressure at 0 dB(A)}] \\ 77 \text{ dB(A)} &= 20 * \log[\text{sound pressure}/20] \\ 77/20 &= \log[\text{sound pressure}/20] \\ 3.85 &= \log[\text{sound pressure}/20] \\ 10^{3.85} &= \text{sound pressure}/20 \\ 7079.458 * 20 &= \text{sound pressure} = \mathbf{141589.16 \text{ micro pascals at 77 dB(A)}} \end{aligned}$$

$$\begin{aligned} \text{Sound pressure decrease} &= 75 - 65 \text{ dB(A)} = 112468 - 35566 = \mathbf{76902 \text{ micro pascals}} \\ \% \text{ decrease}_{75 - 65} &= (76902/112468) * 100 = .6838 * 100 = \mathbf{68.38\% \text{ decrease}} \\ \% \text{ increase}_{65 - 75} &= (112468/35566) * 100 = \mathbf{316\% \text{ increase or approx 3.2 times louder}} \end{aligned}$$

$$\begin{aligned} \text{Sound pressure decrease} &= 77 - 65 \text{ dB(A)} = 141589 - 35566 = \mathbf{106023 \text{ micro pascals}} \\ \% \text{ decrease}_{77 - 65} &= (106023/141589) * 100 = .7488 * 100 = \mathbf{74.88\% \text{ decrease}} \\ \% \text{ increase}_{65 - 77} &= (141589/35566) * 100 = \mathbf{398\% \text{ increase or approx 4 times louder}} \end{aligned}$$