



Education

How to Use the Noise Reduction Rating (NRR)

The NRR describes the average sound level reduction (attenuation) provided by a hearing protection device (HPD) in a laboratory test. Since the NRR is based on laboratory testing, it does not take into account the loss of protection that occurs when hearing protectors are not fit properly or when they are not worn for the entire time that the wearer is exposed to noise.

For most wearers, the NRR identified on the current EPA label (shown here) significantly overestimates the protection of the hearing protector in the workplace. This rating is based on an “experimenter fit” method of measuring HPD attenuation.

Using the EPA Noise Reduction Rating (Experimenter Fit)

The NRR on the EPA label shown to the right is based on the average amount of attenuation provided by an HPD when it is worn by 10 different people during a laboratory test. During this test, the person conducting the test fits the hearing protector on each person. This “experimenter fit” method results in ratings as high as 33 dB. Since research indicates that these ratings overestimate the protection that many wearers will receive in the real world, **3M RECOMMENDS REDUCING THE NRR** before attempting to estimate the effectiveness of an HPD as follows:

1. Subtract 7 dB from the NRR if noise is measured on the A-weighted decibel scale (dBA). (Skip this step if noise is measured on the C-weighted dB scale)
2. Divide the result of step 1 (NRR-7) by 2. This is known as “derating”.

in the real world. For more information about the NRR (SF), contact 3M Technical Service at 800 243-4630.

Estimating Noise Reduction for Individual Users

The labeled values of noise

reduction are based on laboratory tests. It is not possible to use these data to reliably predict levels of protection achieved by a given individual in a particular environment. To ensure

An Example of Reducing the NRR

8-hour TWA noise exposure: 93 dBA
 NRR of hearing protectors: 29 dB
 Subtract 7 dB from the NRR: $29 \text{ dB} - 7 \text{ dB} = 22 \text{ dB}$
 Divide by 2: $22 \div 2 = 11 \text{ dB}$
 Subtract 11 dB from the
 8-hour TWA noise exposure: $93 \text{ dBA} - 11 \text{ dB} = 82 \text{ dB}$
 Decide if 82 dB (known as the “Protected Exposure”) is below the PEL for noise

A New Rating: NRR (SF)

A new “subject fit” method of measuring HPD attenuation will be used in the future to calculate a different rating; the NRR (SF). The people (subjects) in this laboratory test fit their own protector according to the manufacturer’s instructions without the help of the person conducting the test. Compared to the NRR shown on the current EPA label, the NRR (SF) is usually a lower rating that may be closer to the performance of the hearing protector

protection, those wearing hearing protectors for occupational exposures must be enrolled in a hearing conservation program. Non-occupational users should have a hearing evaluation by an audiologist, physician, or other qualified professional, on a regular basis.

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Hearing Protection

Noise Reduction Rating 25 DECIBELS
 (When used as directed)

THE RANGE OF NOISE REDUCTION RATINGS FOR EXISTING HEARING PROTECTORS IS APPROXIMATELY 0 TO 30 (HIGHER NUMBERS DENOTE GREATER EFFECTIVENESS).

Minnesota Mining and Manufacturing Company - St. Paul, MN 55144-1000 1260

Federal law prohibits removal of this label prior to purchase.

LABEL REQUIRED BY U.S. E.P.A. REGULATION 40 CFR PART 211, Subpart B

Laboratory Attenuation Data for 3M™ Hearing Protection Products (Tested in Accordance with ANSI S3.19-1974)

*3M recommends fit testing of hearing protectors. If the NRR is used to estimate typical workplace protection, 3M recommends that the NRR be reduced by 50% or in accordance with applicable regulations.

Disposable Roll Down Earplugs

			Octave Band Attenuation Data (dB)									
Device	NRR*	CSA Class	Frequency (Hz)	125	250	500	1000	2000	3150	4000	6300	8000
E-Ar™ Classic™	29 dB	AL	Mean Attenuation	37.4	40.9	44.8	43.8	36.3	41.9	42.6	46.1	47.3
			Standard Deviation	5.7	5.0	3.3	3.6	4.9	3.0	3.1	3.5	2.7
E-Ar™ Classic™ Mini	29 dB	AL	Mean Attenuation	32.9	37.5	41.4	40.0	36.4	43.9	45.2	48.2	48.1
			Standard Deviation	4.2	4.4	4.2	4.3	4.0	3.0	2.5	2.6	4.4
E-Ar™ Classic™ Plus	33 dB	AL	Mean Attenuation	37.7	43.0	47.0	43.7	38.2	44.5	45.4	49.1	48.4
			Standard Deviation	4.9	4.7	3.3	3.4	3.6	2.8	3.6	4.4	4.4
E-Ar™ Classic™ Plus Metal Detectable	33 dB	AL	Mean Attenuation	37.7	43.0	47.0	43.7	38.2	44.5	45.4	49.1	48.4
			Standard Deviation	4.9	4.7	3.3	3.4	3.6	2.8	3.6	4.4	4.4
E-Ar™ Classic Soft™	31 dB	AL	Mean Attenuation	35.7	41.5	46.2	42.4	37.7	42.5	44.7	47.2	46.4
			Standard Deviation	7.4	8.5	6.2	5.3	2.4	3.7	3.5	5.4	4.5
E-Ar™ E-Z-Fit™	28 dB	AL	Mean Attenuation	35.6	36.9	39.0	37.5	35.1	42.3	44.9	47.7	48.7
			Standard Deviation	5.8	5.0	4.6	5.9	3.0	2.6	3.3	3.4	4.6
E-Ar™ TaperFit™ 2 (2 size earplug)	32 dB	AL	Mean Attenuation	36.4	39.1	41.7	40.7	38.1	44.5	45.9	48.4	48.1
			Standard Deviation	3.6	2.9	3.4	3.5	2.8	2.0	2.3	3.2	3.7
E-Ar™ Classic™ SuperFit™ 30	30 dB	AL	Mean Attenuation	32.9	37.5	41.4	40.0	36.4	43.9	45.2	48.2	48.1
			Standard Deviation	4.2	4.4	4.2	4.3	4.0	3.0	2.5	2.6	4.4
E-Ar™ Classic™ SuperFit™ 33	33 dB	AL	Mean Attenuation	37.7	43.0	47.0	43.7	38.2	44.5	45.4	49.1	48.4
			Standard Deviation	4.9	4.7	3.3	3.4	3.6	2.8	3.6	4.4	4.4
3M™ 1100 and 1110	29 dB	AL	Mean Attenuation	33.9	37.7	39.8	38.5	37.0	41.9	42.7	45.5	44.6
			Standard Deviation	4.7	5.5	5.6	4.8	3.1	3.8	3.4	4.0	3.4
E-Arsoft™ Yellow Neons™ (2 size earplug)	33 dB	AL	Mean Attenuation	38.4	40.3	43.2	41.8	38.6	45.0	45.7	49.6	47.3
			Standard Deviation	4.8	4.8	5.0	4.0	2.6	3.3	3.3	4.0	3.5
E-Arsoft™ Yellow Neon™ Blasts (2 size earplug)	33 dB	AL	Mean Attenuation	38.4	40.3	43.2	41.8	38.6	45.0	45.7	49.6	47.3
			Standard Deviation	4.8	4.8	5.0	4.0	2.6	3.3	3.3	4.0	3.5
E-Arsoft™ SuperFit™ (2 size earplug)	33 dB	AL	Mean Attenuation	38.4	40.3	43.2	41.8	38.6	45.0	45.7	49.6	47.3
			Standard Deviation	4.8	4.8	5.0	4.0	2.6	3.3	3.3	4.0	3.5
E-Arsoft™ Yellow Neons™ Metal Detectable	32 dB	AL	Mean Attenuation	36.1	37.4	39.7	38.6	38.5	44.6	45.4	47.4	48.0
			Standard Deviation	3.6	4.9	4.3	3.1	2.7	3.2	4.1	3.2	3.2
Regular size only	32 dB	AL	Mean Attenuation	36.1	37.4	39.7	38.6	38.5	44.6	45.4	47.4	48.0
			Standard Deviation	3.6	4.9	4.3	3.1	2.7	3.2	4.1	3.2	3.2
3M™ Nitro™	32 dB	AL	Mean Attenuation	36.1	37.4	39.7	38.6	38.5	44.6	45.4	47.4	48.0
			Standard Deviation	3.6	4.9	4.3	3.1	2.7	3.2	4.1	3.2	3.2
3M™ Tattoo™	32 dB	AL	Mean Attenuation	36.1	37.4	39.7	38.6	38.5	44.6	45.4	47.4	48.0
			Standard Deviation	3.6	4.9	4.3	3.1	2.7	3.2	4.1	3.2	3.2
E-Arsoft™ Grippers™	31 dB	AL	Mean Attenuation	38.9	38.7	42.9	41.9	39.2	45.6	47.4	50.9	48.2
			Standard Deviation	4.6	5.4	5.7	5.3	3.4	3.8	3.8	5.3	5.2
E-Arsoft™ FX™	33 dB	AL	Mean Attenuation	40.8	40.8	43.6	41.8	37.9	45.2	47.6	49.0	46.8
			Standard Deviation	2.9	3.5	4.0	3.8	2.6	2.8	3.5	3.8	4.4

NOTE: The Noise Reduction Rating (NRR) shown for 2 size products are based on laboratory testing of regular and large sizes of the earplug.

Push-to-Fit Earplugs

Push-to-Fit Earplugs			Octave Band Attenuation Data (dB)									
Device	NRR*	CSA Class	Frequency (Hz)	125	250	500	1000	2000	3150	4000	6300	8000
E-A-R™ EXPRESS™ Pod Plugs™	25 dB	AL	Mean Attenuation	31.6	32.1	32.2	36.9	35.7	37.0	35.7	38.7	40.5
			Standard Deviation	4.3	4.6	4.8	4.0	3.3	3.3	4.2	5.1	3.4
E-A-R™ EXPRESS™ Pod Plugs™ Metal Detectable	25 dB	AL	Mean Attenuation	31.6	32.1	32.2	36.9	35.7	37.0	35.7	38.7	40.5
			Standard Deviation	4.3	4.6	4.8	4.0	3.3	3.3	4.2	5.1	3.4
E-A-R™ Push-Ins™	28 dB	AL	Mean Attenuation	37.8	37.2	39.8	38.8	35.0	40.0	37.7	38.7	41.1
			Standard Deviation	4.9	5.0	4.8	3.4	3.0	3.5	3.6	4.3	4.1
E-A-R™ Push-Ins™ Metal Detectable	28 dB	AL	Mean Attenuation	37.8	37.2	39.8	38.8	35.0	40.0	37.7	38.7	41.1
			Standard Deviation	4.9	5.0	4.8	3.4	3.0	3.5	3.6	4.3	4.1
E-A-R™ Push-Ins™ with Grip Rings	30 dB	AL	Mean Attenuation	40.2	39.4	41.0	41.0	37.4	41.1	44.0	48.3	47.3
			Standard Deviation	5.8	4.4	4.0	4.8	3.0	5.3	4.5	3.5	3.6
E-A-R™ Push-Ins™ SoftTouch™	31 dB	AL	Mean Attenuation	37.1	38.3	40.1	40.1	38.5	46.7	48.1	46.4	47.2
			Standard Deviation	5.2	5.8	3.3	4.3	3.4	3.8	2.5	3.6	3.1
3M™ E-A-R™ Skull Screws™	32 dB	AL	Mean Attenuation	38.2	37.7	39.9	40.2	38.1	45.0	46.9	48.3	45.6
			Standard Deviation	3.1	3.1	3.0	4.3	2.6	4.0	3.9	5.1	4.6
3M™ PistonZ™	29 dB	AL	Mean Attenuation	37.2	37.7	39.5	40.1	34.3	42.3	41.4	46.2	46.1
			Standard Deviation	5.4	5.2	5.0	3.4	2.8	2.9	3.3	4.7	3.4
3M™ No-Touch™	29 dB	AL	Mean Attenuation	36.9	36.7	39.4	40.4	35.9	42.9	45.5	48.8	45.9
			Standard Deviation	4.9	4.8	4.5	5.9	2.5	3.6	4.0	4.9	4.3

NOTE: The Noise Reduction Rating (NRR) shown for 2 size products are based on laboratory testing of regular and large sizes of the earplug.

Reusable Earplugs

			Octave Band Attenuation Data (dB)									
Device	NRRA	CSA Class	Frequency (Hz)	125	250	500	1000	2000	3150	4000	6300	8000
E-AR™ UltraFit™	25 dB	AL	Mean Attenuation	28.5	30.0	32.9	33.5	34.9	40.4	41.9	42.7	44.6
			Standard Deviation	4.7	4.6	4.6	4.0	3.6	5.4	5.1	3.3	4.1
E-AR™ UltraFit™ Metal Detectable	25 dB	AL	Mean Attenuation	28.5	30.0	32.9	33.5	34.9	40.4	41.9	42.7	44.6
			Standard Deviation	4.7	4.6	4.6	4.0	3.6	5.4	5.1	3.3	4.1
E-AR™ UltraFit Plus™	26 dB	AL	Mean Attenuation	32.3	33.2	34.1	36.0	36.4	40.8	39.7	43.2	44.1
			Standard Deviation	5.1	4.3	4.9	4.6	3.4	3.9	5.5	5.4	3.3
3M™ Tri-Flange™	26 dB	AL	Mean Attenuation	32.3	33.2	34.1	36.0	36.4	40.8	39.7	43.2	44.1
			Standard Deviation	5.1	4.3	4.9	4.6	3.4	3.9	5.5	5.4	3.3
E-AR™ UltraFit™ 27	27 dB	AL	Mean Attenuation	35.2	35.3	36.2	36.9	36.2	43.4	42.7	43.7	44.3
			Standard Deviation	4.7	5.5	4.7	3.9	3.8	4.9	5.3	5.3	4.8
E-AR™ HiFi™	12 dB	C	Mean Attenuation	14.5	15.3	16.9	18.9	22.5	23.0	19.8	22.3	24.6
			Standard Deviation	3.8	2.8	2.5	3.0	3.4	3.0	2.8	2.9	2.6
E-AR™ Arc Plug™ (dual end)	0 dB	-	Mean Attenuation	4.7	4.2	6.0	9.5	16.7	18.6	16.3	16.7	17.2
			Standard Deviation	4.0	4.3	5.0	6.7	4.9	5.7	5.8	6.1	6.8
level dependent	22 dB	AL	Mean Attenuation	32.7	31.8	33.0	32.0	34.5	37.3	38.9	43.8	43.3
			Standard Deviation	5.9	6.1	6.5	5.5	4.1	5.3	6.1	6.7	6.9
3M™ Combat Arms™ Earplug (dual end)	0 dB	-	Mean Attenuation	4.7	4.2	6.0	9.5	16.7	18.6	16.3	16.7	17.2
			Standard Deviation	4.0	4.3	5.0	6.7	4.9	5.7	5.8	6.1	6.8
level dependent	22 dB	AL	Mean Attenuation	32.7	31.8	33.0	32.0	34.5	37.3	38.9	43.8	43.3
			Standard Deviation	5.9	6.1	6.5	5.5	4.1	5.3	6.1	6.7	6.9
3M™ Combat Arms™ Single Tip Earplug (3 size product)	7 dB	C	Mean Attenuation	4.1	4.5	11.0	18.7	24.9	29.8	25.8	18.7	26.5
			Standard Deviation	2.7	2.8	3.9	3.2	3.3	2.7	3.3	3.6	3.3
level dependent	23 dB	BL	Mean Attenuation	30.3	28.7	32.2	31.9	31.7	38.0	35.1	31.9	37.8
			Standard Deviation	3.4	3.9	3.4	3.8	3.0	4.4	4.8	5.4	4.3

NOTE: The Noise Reduction Rating (NRR) shown for 3 size products are based on laboratory testing of the small, medium and large sizes of the earplug.

Banded Hearing Protectors

Banded Hearing Protectors			Octave Band Attenuation Data (dB)									
Device	NRR*	CSA	(Hz)	125	250	500	1000	2000	3150	4000	6300	8000
E-A-R™ Caboflex™	20 dB	BL	Mean Attenuation	28.7	28.3	28.0	28.6	32.2	42.1	44.3	47.2	44.6
Under the Chin Position			Standard Deviation	6.8	6.3	5.8	4.9	3.7	3.2	3.8	3.9	4.7
E-A-R™ Caboflex™	17 dB	BL	Mean Attenuation	25.8	24.9	25.8	27.3	31.7	40.7	42.1	43.0	41.5
Behind the Head Position			Standard Deviation	7.6	7.5	6.1	5.5	4.0	4.3	3.7	4.0	6.1
E-A-R Caps™	17 dB	BL	Mean Attenuation	22.7	21.1	19.4	21.1	31.1	37.7	38.1	40.1	39.2
Under the Chin Position			Standard Deviation	4.4	4.1	3.3	2.5	3.1	2.4	2.5	3.8	4.2
E-A-Rflex™ 28	28 dB	AL	Mean Attenuation	35.3	34.5	36.4	34.0	36.4	43.2	45.5	47.9	46.3
Under the Chin Position			Standard Deviation	6.3	5.2	3.9	3.5	3.2	3.6	3.1	4.4	4.4
E-A-Rflex™ Foam Tips	25 dB	AL	Mean Attenuation	32.7	32.8	34.2	35.2	38.2	45.5	45.5	49.0	48.2
Under the Chin Position			Standard Deviation	4.2	5.5	5.7	5.7	3.3	3.4	3.4	3.7	4.1
E-A-Rflex™ Foam Tips	25 dB	AL	Mean Attenuation	32.5	32.9	34.1	36.3	37.8	44.7	45.1	46.2	46.3
Behind the Head Position			Standard Deviation	4.6	5.1	5.6	5.9	4.5	4.0	3.4	3.2	3.6
E-A-Rflex™ Foam Tips	25 dB	AL	Mean Attenuation	32.6	31.2	31.8	35.0	36.9	44.1	44.6	47.3	46.7
Over the Head Position			Standard Deviation	4.6	5.2	5.4	5.4	3.4	4.3	3.9	4.2	3.7
E-A-Rflex™ Premolded Tips	27 dB	AL	Mean Attenuation	40.0	41.3	43.6	39.4	37.3	39.2	39.6	44.0	46.2
Under the Chin Position			Standard Deviation	5.7	6.2	6.6	5.4	4.0	4.7	6.2	6.1	5.6
E-A-Rflex™ Premolded Tips	24 dB	AL	Mean Attenuation	39.7	40.1	43.8	40.1	37.6	39.4	39.8	44.8	47.2
Behind the Head Position			Standard Deviation	8.8	8.9	8.9	7.5	6.3	5.9	6.4	5.7	3.8
E-A-Rflex™ Premolded Tips	24 dB	AL	Mean Attenuation	38.6	39.3	42.0	38.0	36.5	37.4	36.9	43.0	45.8
Over the Head Position			Standard Deviation	6.8	7.4	7.1	6.5	4.0	6.2	7.3	6.2	4.3
E-A-R™ Swerve™ Comfort Pods	19 dB	BL	Mean Attenuation	26.3	23.8	22.0	24.6	32.9	37.2	38.7	45.0	40.6
Behind the Head Position			Standard Deviation	3.6	3.6	3.7	2.8	3.2	3.9	2.7	3.0	3.4
E-A-R™ Swerve™ Flex 28 Tips	28 dB	AL	Mean Attenuation	35.7	35.1	37.6	38.2	36.7	45.6	46.7	47.4	44.9
Behind the Head Position			Standard Deviation	5.5	4.9	5.7	5.2	3.8	3.9	4.3	5.4	3.7

NOTE: The Noise Reduction Rating (NRR) shown for 2 size products are based on laboratory testing of regular and large sizes of the earplug.

Laboratory Attenuation Data for 3M™ Hearing Protection Products (Tested in Accordance with ANSI S3.19-1974)

*3M recommends fit testing of hearing protectors. If the NRR is used to estimate typical workplace protection, 3M recommends that the NRR be reduced by 50% or in accordance with applicable regulations.

3M™ E-A-R™ Earmuffs			Octave Band Attenuation Data (dB)									
Device	NRR*	CSA Class	Frequency (Hz)	125	250	500	1000	2000	3150	4000	6300	8000
Model 1000	20 dB	B	Mean Attenuation	11.7	16.2	26.5	31.6	32.5	35.0	38.1	41.8	41.8
Over the Head Position			Standard Deviation	3.3	2.7	2.7	2.6	3.0	2.8	2.5	4.7	3.8
Model 1000	22 dB	B	Mean Attenuation	14.8	17.1	27.7	35.2	34.0	36.8	39.1	44.0	43.3
Behind the Head Position			Standard Deviation	3.2	3.1	2.3	3.5	3.0	3.2	3.3	3.0	3.1
Model 1000	22 dB	A	Mean Attenuation	14.4	18.4	28.0	34.8	34.3	36.5	38.8	43.7	43.2
Under the Chin Position			Standard Deviation	3.7	3.4	2.5	2.8	3.4	2.6	2.9	2.9	3.0
Model 2000H	21 dB	B	Mean Attenuation	13.0	17.7	25.6	30.1	32.8	35.9	33.5	36.4	37.2
Hard Hat Attached			Standard Deviation	3.6	2.7	2.4	2.5	3.4	2.4	2.0	3.3	3.7
Model 3000	25 dB	A	Mean Attenuation	16.5	21.8	33.8	40.4	35.1	36.2	38.4	38.3	39.7
Over the Head Position			Standard Deviation	2.5	2.7	3.0	3.9	3.4	3.4	3.2	2.2	2.8
Model 3000	26 dB	AL	Mean Attenuation	21.2	22.3	33.1	41.2	34.7	36.1	38.3	37.9	38.7
Behind the Head Position			Standard Deviation	2.4	2.9	2.3	2.7	3.2	2.7	1.9	2.7	4.2
Model 3000	26 dB	AL	Mean Attenuation	20.5	22.7	32.6	41.2	34.6	37.3	38.9	37.3	39.5
Under the Chin Position			Standard Deviation	4.3	2.6	2.6	2.9	3.5	2.5	2.9	2.1	4.0

3M™ PELTOR™ Earmuffs			Octave Band Attenuation Data (dB)									
Device	NRR*	CSA Class	Frequency (Hz)	125	250	500	1000	2000	3150	4000	6300	8000
Optime™ 105 - H10A	30 dB	AL	Mean Attenuation	21.0	26.0	36.6	40.6	38.0	41.8	42.7	41.7	41.3
Over the Head Position			Standard Deviation	1.9	2.3	2.3	2.4	2.5	2.7	1.8	2.1	2.5
Optime™ 105 - H10B	29 dB	AL	Mean Attenuation	21.0	26.4	37.1	40.0	36.9	40.4	42.1	41.6	42.2
Behind the Head Position			Standard Deviation	2.7	2.6	3.0	3.6	2.4	3.4	2.8	2.9	2.5
Optime™ 105 - H10P3	27 dB	AL	Mean Attenuation	20.7	25.5	36.2	38.3	35.7	39.3	41.3	42.1	41.3
Hard Hat Attached			Standard Deviation	3.0	3.3	3.9	3.4	2.9	3.5	3.4	2.5	3.1
Optime™ 101 - H7A	27 dB	A	Mean Attenuation	15.5	24.5	35.3	40.0	36.9	39.9	37.5	37.7	38.1
Over the Head Position			Standard Deviation	3.0	2.0	2.4	2.8	2.6	2.8	3.2	2.7	3.9
Optime™ 101 - H7B	26 dB	A	Mean Attenuation	16.8	23.5	34.8	39.7	36.5	35.8	36.2	40.1	40.1
Behind the Head Position			Standard Deviation	3.4	2.6	2.1	2.6	2.3	2.2	2.4	2.4	3.0
Optime™ 101 - H7P3*	24 dB	A	Mean Attenuation	15.3	21.8	33.7	40.0	36.2	35.5	34.7	37.2	35.5
Hard Hat Attached			Standard Deviation	2.6	2.5	2.6	3.3	3.8	3.0	2.7	3.1	3.2
Optime™ 98 - H9A	25 dB	A	Mean Attenuation	15.5	22.0	33.7	39.7	36.5	42.7	40.1	39.8	40.6
Over the Head Position			Standard Deviation	2.7	3.5	2.6	2.4	2.6	2.6	2.8	2.7	2.5
Food Industry Earmuff - H9A-02	26 dB	A	Mean Attenuation	15.1	21.7	31.2	38.6	35.6	40.5	43.0	40.9	41.8
Over the Head Position			Standard Deviation	2.8	1.9	2.7	2.0	3.0	3.5	3.2	2.0	2.7
Optime™ 98 - H9P3*	23 dB	A	Mean Attenuation	14.8	20.2	30.5	38.7	36.4	38.9	36.3	39.4	38.3
Hard Hat Attached			Standard Deviation	2.5	3.1	3.4	2.6	3.0	2.9	3.0	3.7	2.9
Optime™ 95 - H8A	21 dB	B	Mean Attenuation	12.4	15.0	26.2	35.2	35.2	30.9	33.3	36.0	37.5
Over the Head Position			Standard Deviation	2.6	1.8	2.5	3.2	2.5	3.0	2.0	4.5	3.2
Optime™ 95 - H8B	21 dB	B	Mean Attenuation	13.2	14.2	25.1	34.2	36.4	30.4	35.1	37.0	38.5
Behind the Head Position			Standard Deviation	2.9	1.6	2.6	2.6	3.0	2.8	2.1	4.0	2.8
Optime™ 95 - H8F	21 dB	B	Mean Attenuation	12.4	15.0	26.2	35.2	35.2	30.9	33.3	36.0	37.5
Over the Head Position			Standard Deviation	2.6	1.8	2.5	3.2	2.5	3.0	2.0	4.5	3.2
Optime™ 95 - H9P3E	21 dB	B	Mean Attenuation	12.3	17.2	27.8	32.8	33.9	36.5	36.0	36.5	36.8
Hard Hat Attached			Standard Deviation	2.7	3.0	2.5	2.8	2.9	4.1	3.0	4.3	4.6
H31A	24 dB	A	Mean Attenuation	13.2	20.4	30.8	35.8	37.0	41.3	37.1	34.1	35.5
Over the Head Position			Standard Deviation	2.6	2.5	2.7	2.6	3.2	2.5	2.5	2.9	2.2
H31P3*	23 dB	A	Mean Attenuation	12.2	18.9	29.7	34.8	37.2	37.0	35.8	35.0	37.4
Hard Hat Attached			Standard Deviation	2.1	2.6	2.3	2.7	3.6	2.9	2.4	4.0	3.9
H505B Welding Helmet Earmuff	17 dB	B	Mean Attenuation	12.7	13.2	22.9	21.6	31.9	40.2	39.5	37.6	38.6
Behind the Head Position			Standard Deviation	5.5	2.1	2.6	2.3	2.5	3.4	3.5	3.6	3.5
X1A	22 dB	A	Mean Attenuation	16.0	18.3	27.7	37.6	35.1	42.2	41.4	39.4	39.3
Over the Head Position			Standard Deviation	5.2	3.1	3.0	3.5	2.8	2.8	2.6	2.6	3.8
X1P3E	21 dB	B	Mean Attenuation	13.8	17.3	27.4	35.6	34.5	41.8	40.1	36.8	36.1
Hard Hat Attached			Standard Deviation	4.5	3.2	2.9	2.8	2.9	2.9	2.9	3.7	4.1
X2A	24 dB	A	Mean Attenuation	14.9	21.6	31.8	41.0	36.7	39.1	38.5	39.0	39.0
Over the Head Position			Standard Deviation	4.2	3.3	2.3	2.5	3.0	2.4	2.0	2.8	3.4
X2P3E	24 dB	A	Mean Attenuation	15.2	21.3	32.6	39.2	35.9	37.7	37.1	38.6	37.3
Hard Hat Attached			Standard Deviation	4.2	3.1	2.8	3.2	3.3	2.8	2.1	2.5	3.0
X3A	28 dB	AL	Mean Attenuation	23.4	27.7	29.4	42.5	38.8	39.3	42.3	39.5	39.5
Over the Head Position			Standard Deviation	3.0	2.1	3.1	2.6	2.7	4.0	3.3	2.6	2.8
X3P3E	25 dB	AL	Mean Attenuation	19.6	24.1	29.7	39.1	35.7	38.2	40.3	37.1	35.4
Hard Hat Attached			Standard Deviation	3.3	3.1	2.5	3.9	3.1	4.7	3.5	4.4	4.9
X4A	27 dB	AL	Mean Attenuation	20.5	24.1	32.8	40.7	37.6	44.5	45.4	42.4	42.3
Over the Head Position			Standard Deviation	4.6	3.4	1.9	2.8	2.9	3.1	2.5	3.1	3.0
X4P3E	25 dB	A	Mean Attenuation	18.1	21.6	32.4	40.1	36.5	44.2	46.2	43.7	43.3
Hard Hat Attached			Standard Deviation	4.9	2.6	2.0	2.3	3.2	3.9	2.7	2.4	3.0
X5A	31 dB	AL	Mean Attenuation	23.9	30.5	41.1	43.0	38.0	43.1	44.0	41.1	40.3
Over the Head Position			Standard Deviation	4.1	2.2	2.8	2.9	2.7	2.9	2.4	2.6	2.2
X5P3E	31 dB	AL	Mean Attenuation	21.6	29.3	41.0	42.4	37.5	41.7	42.5	40.6	40.5
Hard Hat Attached			Standard Deviation	3.2	2.5	2.8	3.1	2.2	2.3	2.5	2.9	2.6

Laboratory Attenuation Data for 3M™ Hearing Protection Products (Tested in Accordance with ANSI S3.19-1974)

*3M recommends fit testing of hearing protectors. If the NRR is used to estimate typical workplace protection, 3M recommends that the NRR be reduced by 50% or in accordance with applicable regulations.

3M™ PELTOR™ Communications Eartips

Device	NRR*	CSA Class	Octave Band Attenuation Data (dB)									
			Frequency (Hz)	125	250	500	1000	2000	3150	4000	6300	8000
ORA TAC - Classic™ Eartip	31 dB	AL	Mean Attenuation	37.3	38.1	42.6	40.8	36.7	42.6	43.5	48.1	45.9
			Standard Deviation	4.8	3.5	3.6	2.7	3.3	3.6	4.3	5.2	3.8
ORA TAC - Skull Screw™ Eartip	29 dB	AL	Mean Attenuation	38.0	36.8	39.2	44.8	37.7	43.1	42.6	46.4	45.2
			Standard Deviation	5.0	5.1	5.8	5.2	4.2	5.3	5.6	5.4	2.7
ORA TAC - UltraFit™ Eartip	20 dB	AL	Mean Attenuation	35.1	35.1	36.3	32.3	33.7	37.0	37.7	39.1	39.1
			Standard Deviation	9.3	7.3	8.1	6.5	5.5	7.4	6.5	6.9	5.6
ORA TAC - CCC-GRM-25 Eartip	26 dB	AL	Mean Attenuation	34.1	30.2	34.7	34.7	35.4	38.4	36.7	42.9	43.8
			Standard Deviation	3.4	4.1	3.7	3.9	3.7	4.0	4.3	4.1	4.2
TEP-100 Tactical Earplug - Skull Screw™ Eartip	30 dB	AL	Mean Attenuation	36.3	35.7	39.8	41.4	40.4	43.0	41.9	48.2	46.0
			Standard Deviation	5.3	5.5	5.5	4.2	3.4	4.6	3.5	4.6	4.2
TEP-100 Tactical Earplug - UltraFit™ Eartip (3 size product)	23 dB	AL	Mean Attenuation	36.2	33.7	34.7	32.0	34.5	37.4	35.6	38.0	37.5
			Standard Deviation	5.1	5.2	5.5	3.9	3.4	5.3	6.5	4.4	5.4
TEP-100 Tactical Earplug - CCC-GRM-25 Eartip	27 dB	AL	Mean Attenuation	34.5	30.6	36.3	35.2	35.5	38.6	37.6	44.6	45.7
			Standard Deviation	4.2	3.9	4.1	3.0	3.5	3.3	3.8	3.6	4.3
E-A-R buds™ - Skull Screw™ Eartip	29 dB	AL	Mean Attenuation	38.0	36.8	39.2	44.8	37.7	43.1	42.6	46.4	45.2
			Standard Deviation	5.0	5.1	5.8	5.2	4.2	5.3	5.6	5.4	2.7
E-A-R buds™ - UltraFit™ Eartip	20 dB	AL	Mean Attenuation	35.1	35.1	36.3	32.3	33.7	37.0	37.7	39.1	39.1
			Standard Deviation	9.3	7.3	8.1	6.5	5.5	7.4	6.5	6.9	5.6
E-A-R buds™ - CCC-GRM-25 Eartip	27 dB	AL	Mean Attenuation	34.5	30.6	36.3	35.2	35.5	38.6	37.6	44.6	45.7
			Standard Deviation	4.2	3.9	4.1	3.0	3.5	3.3	3.8	3.6	4.3

NOTE: The Noise Reduction Rating (NRR) shown for 3 size products are based on laboratory testing of the small, medium and large sizes of the eartip